AMITY UNIVERSITY
RAJASTHAN

Syllabus Revision

Amity Institute of Information Technology (AIIT)

Master of Computer Applications (MCA)

Programme Code: 121450

Duration – 2 Years Full Time

Programme Structure
and
Curriculum & Scheme of Examination
2021-2023

AMITY UNIVERSITY

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PREAMBLE

Amity University aims to achieve academic excellence by providing multi-faceted education to students and encourage them to reach the pinnacle of success. The University has designed a system that would provide rigorous academic programme with necessary skills to enable them to excel in their careers.

This booklet contains the Programme Structure, the Detailed Curriculum and the Scheme of Examination. The Programme Structure includes the courses (Core and Elective), arranged semester wise. The importance of each course is defined in terms of credits attached to it. The credit units attached to each course has been further defined in terms of contact hours i.e. Lecture Hours (L), Tutorial Hours (T), Practical Hours (P). Towards earning credits in terms of contact hours, 1 Lecture and 1 Tutorial per week are rated as 1 credit each and 2 Practical hours per week are rated as 1 credit. Thus, for example, an L-T-P structure of 3-0-0 will have 3 credits, 3-1-0 will have 4 credits, and 3-1-2 will have 5 credits.

The Curriculum and Scheme of Examination of each course includes the course objectives, course contents, scheme of examination and the list of text and references. The scheme of examination defines the various components of evaluation and the weightage attached to each component. The different codes used for the components of evaluation and the weightage attached to them are:

Components	Codes	Weightage (%)
Case Discussion/ Presentation/ Analysis	C	05 - 10
Home Assignment	H	05 - 10
Project	P	05 - 10
Seminar	S	05 - 10
Viva	V	05 - 10
Quiz	Q	05 - 10
Class Test	CT	10 - 15
Attendance	A	05
End Semester Examination	EE	50

It is hoped that it will help the students study in a planned and a structured manner and promote effective learning. Wishing you an intellectually stimulating stay at Amity University.

July, 2020

PROGRAMME LEARNING OUTCOME (PLO)

MASTER OF COMPUTER APPLICATIONS (MCA)

PLO- 1 Apply a sound knowledge of Computer Science and applications to the identification, analysis and solution of Computer Science problems;

PLO- 2 Recognize and identify the emerging technologies and reveal their application areas;

PLO- 3 Utilize the algorithms, tools and techniques used in Software development and Demonstrate their mastery of computer applications in the core knowledge areas;

PLO- 4 Apply a high level of knowledge and skills in the applications of computer programming, web designing and networking; to Grow and develop as a software, web and network professional.

SKILL DEVELOPMENT DETAILS WITH CREDITS OF MCA PROGRAMME

Sr. No.	Sem	Skill Development	Credit	Employability	Credit	Entrepreneurship	Credit	Total Nos.	Total Credit
1	I	8	16	1	3	1	4	**10**	**23**
2	II	4	8	2	7	0	0	**6**	**15**
3	III	4	8	5	13	0	0	**9**	**21**
4	IV	0	0	3	30	0	0	**3**	**30**
	Total	**16**	**32**	**11**	**53**	**1**	**4**	**28**	**89**

SKILL DEVELOPMENT SUBJECTS IN MCA PROGRAMME

Sem	Course Code	Course Name
I	MCA102	Core Java
I	MCA122	Core Java Lab
I	MCA103	Advanced Database Management System
I	MCA123	Advanced Database Management System Lab
I	MCA136	Open Source Technology
I	MCA146	Open Source Technology Lab
I	MCA137	Network Fundamental
I	MCA147	Network Fundamental Lab
II	MCA236	ASP.NET using C#
II	MCA237	PHP
II	MCA246	ASP.NET using C# Lab
II	MCA247	PHP Lab
III	MCA337	Python
III	MCA347	Python Lab
III	MCA339	Android Programming
III	MCA349	Android Programming Lab

Employability

Sem	Course Code	Course Name
I	MCA131	Mobile Computing
II	MCA231	Cloud Computing
II	MCA239	Statistical Analysis using R
II	MCA249	Statistical Analysis using R Lab
III	MCA331	Search Engine Optimization
III	MCA332	Digital Marketing Analytics
III	MCA335	Salesforce Technology
III	MCA338	Big Data & Analytic using R
III	MCA348	Big Data & Analytic using R Lab
IV	MCA460	Project Work
IV	MCA461	Internship
IV	MCA462	Dissertation

Entrepreneurship

Sem	Course Code	Course Name
I	MCA201	Software Engineering & Project Management
I	MCA221	Software Engineering & Project Management Lab

PROGRAMME STRUCTURE CREDITS SUMMARY
Master of Computer Applications (MCA)-2021

	Credits PG (2 years/ 4 Semesters)							
Semester	CC	DE	VA	OE	EVS	NTCC	ANDP	Total
I	11	07	04	0	0	01	02	25
II	11	07	04	03	0	06	02	33
III	07	07	04	03	0	10	02	33
IV	0	0	0	0	0	30	0	30
Total	29	21	12	06	0	47	06	121

Core Courses	CC
Domain Electives	DE
Value Added Course	VA
Open Electives	OE
Environmental Science	EVS
Project Work (Non Teaching Credit Course)	NTCC
Anandam Project	ANDP

PROGRAMME STRUCTURE SUBJECTWISE CATEGORY SUMMARY
Master of Computer Applications (MCA)-2021

	Courses/Subjects for PG (2 years/ 4 Semesters) MCA Programme							
Semester	CC	DE	VA	OE	EVS	NTCC	ANDP	Total
I	05	11	06	0	0	01	01	24
II	05	13	06	01	0	01	01	27
III	03	13	06	01	0	03	01	27
IV	0	0	0	0	0	03	0	03
Total	13	37	18	02	0	8	03	81

Core Courses	CC
Domain Electives	DE
Value Added Course	VA
Open Electives	OE
Environmental Science	EVS
Project Work (Non Teaching Credit Course)	NTCC
Anandam Project	ANDP

PROGRAMME STRUCTURE
2021-23

FIRST SEMESTER

S. No.	Course Title	Category	Lecture (L)	Tutorial (T)	Practical (P)	Total Credits
CORE COURSE (CC)						
MCA101	Optimization Technique	CC	2	1	-	3
MCA102	Core Java	CC	2	1	-	3
MCA103	Advanced Database Management System	CC	2	1	-	3
MCA122	Core Java Lab	CC	-	-	2	1
MCA123	Advanced Database Management System Lab	CC	-	-	2	1
DOMAIN ELECTIVES (DE)						
Elective-I (Without Lab)	**Select any ONE**					
MCA131	Mobile Computing	DE	2	1	-	3
MCA132	Theory of Computation	DE				
MCA133	Analysis and Design of Algorithms	DE				
Elective-II (With Lab)	**Select any ONE**					
MCA134	Computer Graphics	DE	2	1	-	3
MCA135	Data Warehousing and Mining	DE				
MCA136	Open Source Technology	DE				
MCA137	Network Fundamental	DE				
MCA144	Computer Graphics Lab	DE	-	-	2	1
MCA145	Data Warehousing and Mining Lab	DE				
MCA146	Open Source Technology Lab	DE				
MCA147	Network Fundamental Lab	DE				
Non Teaching Credit Course (NTCC)						
MCA151	Report on Workshop / Social Work	NTCC	-	-	-	1
AND001	Anandam-I	ANDP	-	-	-	2
VALUE ADDED COURSES (VAC)						
BCS111	Communication Skills –I	VA	1	-	-	1
BSS111	Behavioural Science-I (Self Development and Interpersonal Skills)	VA	1	-	-	1
	Foreign Language		2	-	-	2
FLT111	French	VA				
FLG111	German	VA				
FLS111	Spanish	VA				
FLC111	Chinese	VA				
	TOTAL					**25**

SECOND SEMESTER

S. No.	Course Title	Category	Lecture (L)	Tutorial (T)	Practical (P)	Total Credits
CORE COURSE (CC)						
MCA201	Software Engineering & Project Management	CC	2	1	-	3
MCA202	Advanced Java	CC	2	1	-	3
MCA203	Distributed Operating System	CC	2	1	-	3
MCA221	Software Engineering & Project Management Lab	CC	-	-	2	1
MCA222	Advanced Java Lab	CC	-	-	2	1
DOMAIN ELECTIVES (DE)						
Elective-I (Without Lab)	**Select any ONE**					
MCA231	Cloud Computing	DE	2	1	-	3
MCA232	Soft Computing	DE				
MCA233	High Performance Computing	DE				
MCA234	Embedded System	DE				
MCA235	Accessing the WAN	DE				
Elective-II (With Lab)	**Select any ONE**					
MCA236	ASP.NET using C#	DE	2	1	-	3
MCA237	PHP	DE				
MCA238	Routing Protocol & Concept	DE				
MCA239	Statistical Analysis using R	DE				
MCA246	ASP.NET using C# Lab	DE	-	-	2	1
MCA247	PHP Lab	DE				
MCA248	Routing Protocol & Concept Lab	DE				
MCA249	Statistical Analysis using R Lab	DE				
OPEN ELECTIVES (OE)						
	Open Elective		2	1	-	3
Non Teaching Credit Course (NTCC)						
MCA250	Minor Project	NTCC	-	-	-	6
AND002	Anandam-II	ANDP	-	-	-	2
VALUE ADDED COURSES (VAC)						
BCS211	Communication Skills –II	VA	1	-	-	1
BSS211	Behavioural Science-II (Behavioural Communication and Relationship Management)	VA	1	-	-	1
	Foreign Language		2	-	-	2
FLT211	French	VA				
FLG211	German	VA				
FLS211	Spanish	VA				
FLC211	Chinese	VA				
	TOTAL					**33**

THIRD SEMESTER

S. No.	Course Title	Category	Lecture (L)	Tutorial (T)	Practical (P)	Total Credits
CORE COURSE (CC)						
MCA301	Artificial Intelligence	CC	2	1	-	3
MCA302	Information Storage Management	CC	2	1	-	3
MCA321	Artificial Intelligence Lab	CC	-	-	2	1
DOMAIN ELECTIVES (DE)						
Elective-I (Without Lab)	**Select any ONE**					
MCA331	Search Engine Optimization	DE	2	1	-	3
MCA332	Digital Marketing Analytics	DE				
MCA333	Compiler Design	DE				
MCA334	Digital Image Processing	DE				
MCA335	Salesforce Technology	DE				
Elective-II (With Lab)	**Select any ONE**					
MCA336	LAN Switching & Wireless	DE	2	1	-	3
MCA337	Python	DE				
MCA338	Big Data & Analytic using R	DE				
MCA339	Android Programming	DE				
MCA346	LAN Switching & Wireless Lab	DE	-	-	2	1
MCA347	Python Lab	DE				
MCA348	Big Data & Analytic using R Lab	DE				
MCA349	Android Programming Lab	DE				
OPEN ELECTIVES (OE)						
	Open Elective	OE	2	1	-	3
Non Teaching Credit Course (NTCC)						
MCA350	Minor Project	NTCC	-	-	-	6
MCA351	Report on Paper Presentation in Conference	NTCC	-	-	-	1
MCA352	Summer Internship Project	NTCC	-	-	-	3
AND003	Anandam-III	ANDP	-	-	-	2
VALUE ADDED COURSES (VAC)						
BCS311	Communication Skills –III	VA	1	-	-	1
BSS311	Behavioural Science-III (Leading Through Teams)	VA	1	-	-	1
	Foreign Language		2	-	-	2
FLT311	French	VA				
FLG311	German	VA				
FLS311	Spanish	VA				
FLC311	Chinese	VA				
	TOTAL					**33**

FOURTH SEMESTER

S. No.	Course Title	Category	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
Non Teaching Credit Course (NTCC)					
Elective	**Select any ONE**				
MCA460	Project Work	NTCC	-	-	30
MCA461	Internship	NTCC			
MCA462	Dissertation	NTCC			
	TOTAL				**30**

OPTIMIZATION TECHNIQUES

Course Code	L	T	P	Credit	Semester
MCA 101	2	1	-	3	I

Course Learning Outcomes

1. Ability to apply the theory of optimization methods and algorithms to develop and for solving various types of optimization problems.
2. Use the various optimization methods to fulfill the demand allocation under different scenarios.
3. Examine the description of an engineering design problem to assess whether the solution may be facilitated by an optimization method and describe project management objectives.
4. To expose the basic characteristic features of a queuing system and acquire skills in analyzing queuing models.
5. Determine mathematically and logically the actions that "players" would take to secure the best outcomes for themselves in a wide array of "games".

Course Contents:

Module I: Introduction of OR and Linear Programming

Basic Deification, Nature and Significance of OR, feature of OR Approach Application and Scope of OR, General Methods for Solving Or Models. General Structure of Linear Programming, Advantages and Limitations of Linear Programming, Application Areas of Linear Programming.

Linear Programming Solutions: Mathematical formulation of LPP, Standard form of LPP, Multiple Solution, Unbounded Solutions, Infeasible Solution of LPP.

Module II: Simplex Method

Maximization and Minimization Problem, Solution of LPP using Graphical method, Simplex Method, two Phase Method, Big M Method.

Module III: Duality in LPP

Dual Linear Programming Problem, Rules for Constructing the Dual from Primal, Feature of Duality

Module IV: Transportation Problem

Mathematical Model of Transportation Problem, Transportation Method, North West Corner Method, Linear Cost Method, Vogel's Approximation Method, Unbalanced Supply and Demand, Degeneracy Problem, Alternative Optional Solution, Maximization Transportation Problem..

Module V: Queueing Models

Markovian queues – Birth and Death processes – Single and multiple server queueing models (M/M/1 & M/M/S) – Little‟s formula – Queues with finite waiting rooms – Queues with impatient customers: Balking and reneging.

Module VI: Theory of Games

Two Person Zero-Sum Games, Pure Strategies, Game with Saddle Point, Games without Saddle Point, Rule of Dominance, Methods for Solving Problems without Saddle Point.

Module VII: Project Management

Basic Idea of PERT & CRM, Difference between PERT & CPM, PERT/CPM Network Components and Precedence Relationship Critical Path Analysis, Project Scheduling, Project Time-Cost, Trade-Off, Resource Allocation.

Examination Scheme:

Components	**CT-1**	**Assignement**	**P/V**	**Quiz**	**Attd**	**EE**
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Operations Research, J K Sharma, Macmillan Publication

References:

- Operations Research, H. A. Taha
- Operations Research, Kanti Swaroop, Macmillan Publication

CORE JAVA

Course Code	L	T	P	Credit	Semester
MCA102	2	1	-	3	I

Course Learning Outcomes

1.Recognize the concept of object oriented programming for java based applications.

2. Identify the utility of various java keywords, class libraries and API.

3. Describe java class & objects, inheritance, packages, interface, multithreading, events and applets with hands on coding.

4. Apply hands on real life applications development using standard tools.

5. Create graphical user interface based advanced applications.

Course Contents:

Module I: Introduction to Java

Introduction, Java Virtual Machine and their architecture, JDK & JRE, Environment Variable, Features and differences with C++, Data Types, Identifiers and Variables, Operators and Expressions, Type Conversion, Control flow, arrays, Constants, Methods. Java Class Libraries: java.lang, java.io, java.math, java.text and java.util package.

Module II: Java with Object Orientated Features

Class & Objects: Introducing Classes, A Closer look at Methods and Classes, constructor, static members. **Inheritance**: Types and use of super keyword, Final method and classes. **Interfaces and Packages**: Definition and their implementation, defining class path. **Exception Handling**: Errors and Exceptions, Exception Handling Mechanism, caught and uncaught exceptions, Exception class hierarchy, handling exceptions with try, catch, finally block, defining custom exception. **Multithreading**: Thread life cycle, creating and controlling threads.

Module III: I/O and Applets

Run time input/output operations, io classes and their methods implementation, Applets life cycle, Applets program and their execution, Displaying various geometric shapes using 2D Graphics.

Module IV: GUI components using AWT and Event Handling

AWT: Making Windows, Frames, Panels, and Forms. Working with command buttons, text fields, labels, list boxes, layout manager, menus etc. **Event Handling**: Event Handling, Delegation Model, Event Classes, Event Listener interfaces, Adapter Classes.

Examination Scheme:

Components	CT-1	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Patrick Naughtn and Herbert Schildt The Complete Reference, Java 2, TMH
- Douglas E.Cmer, Computer Networks & Internet, Pearson.

References:

- The Internet :By- Douglas E.Cmer: TMH

ADVANCED DATABASE MANAGEMENT SYSTEM

Course Code	L	T	P	Credit	Semester
MCA 103	2	1	-	3	I

Course Learning Outcomes:

1. To analyse the basics of SQL and construct queries using Pl/SQL efficiently and apply object oriented features for developing database .
2. To understand the trigger and stored procedure in database which automatically invokes whenever a special event in the database occurs.
3. Recognise the distributed DBMS which provide other functions including integration of heterogeneous data, query optimization and processing, concurrency control and recovery.
4. Understand the parallel database for solving the problem by splitting database operations into separate tasks.
5. Analyse the Object Oriented (OO) Data Model in DBMS for solving the complex real-world problems and demonstrate the need of a data model that more closely represented the real world.

Course Contents:

Module -I: Basics of PL/SQL

PL/SQL basics, blocks, architecture, variables, constants, attributes, character set, PL/SQL, data types, control structure, conditional and sequential control statements.

Module -II: PL/SQL

PL/SQL precompiler, cursors, type of cursors, exceptions, Indexing, View, triggers, PL/SQL Stored procedures and packages

Module -III: Distributed Databases

Introduction, Advantages, Architecture, Homogeneous & Heterogeneous DDBMS, Distributed Data Storage (Fragmentation & Replication), Distributed Transactions, Commit protocol, Concurrency Control in Distributed Databases, Availability, Distributed Query Processing

Module-IV: Parallel Databases

Introduction, Architecture, I/O Parallelism and Skew, Inter-query Parallelism, Intra-query Parallelism, Intra-operation Parallelism (Parallel Sort, Parallel Join), Interoperation Parallelism, Design of Parallel Systems.

Module-V: Object Oriented Database Management System

Introduction, Object-Oriented Data Model, Object Oriented Languages, Persistent Programming Languages, Object-Relational Databases: Nested Relations, Complex Types, Inheritance, Reference Types, Querying with Complex Types, Functions and Procedures Storage for Object Databases.

Examination Scheme:

Components	CT-1	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

TEXT BOOKS:

1. H. F. Korth and A. Silberschatz: Database System Concepts, McGraw Hill, New Delhi, 1997.
2. Raghu Ramkrishnan, Johannes Gehrke , “Database Management Systems”, McGraw Hill International, 2007
3. Abraham Silberschatz, Henry Korth, S, Sudarshan,, “Database System Concepts”, McGraw Hill International, 2005
4. C.J.Date, Longman, “An Introduction to Database System”, Pearson Education, 2003

REFERENCE BOOKS:

1. R. A. Elmasri and S. B. Navathe: Fundamentals of Database Systems, 3rd ed., Addison-Wesley, 1998.
2. R. Ramakrishnan: Database Management Systems, 2nd ed., McGraw Hill, New York, 1999.
3. Elmasri R and Navathe SB, "Fundamentals of Database Systems", Addison Wesley, 2000.
4. Thomas Connolly, Carolyan Begg,, "Database Systems,: A Practical Approach to Design,
5. Implementation and Management, Addison Wesley, 2014 10
6. Ceri Pelagatti, "Distributed Database: Principles and System" , Addison Wesley, 1999.

CORE JAVA LAB

Course Code	L	T	P	Credit	Semester
MCA122	-	-	2	1	I

1. Investigate different concepts of programming approaches in terms of application or project development.

2. Create methods and programs within the field of security as well as developing logical and analytical approaches to programming problems independently.

3. Apply his/her knowledge in new areas within field of basic and advanced programming.

4. Develop independently relevant applications using self logic in the field of security programming languages. These methods include performing experiment/ programs and interpreting their results.

1 Write a program to display your information using print () method.

2 Write a program to display "Java is an object oriented programming language" using command line arguments.

3 Write a program to perform all the arithmetic operation by taking inputs from command line.

4 Write a program to perform the addition of n nos. by taking inputs from command line.

5 Write a program to compute & print factorial of any given number.

6 Write a program to compute the sum of digits of a given integer.

7 Write a program to calculate & print first n Fibonacci numbers.

8 Write a program to reverse the digits of a numbers.

9 Write a program to show the use of typecasting.

10 Write a program to show the use of type conversion.

11 Write a program to show the use of Boolean data type.

12 Write a program to show the scope and lifetime of a variable.

13 Write a program to sort element of an array.

14 Write a program to perform the matrix addition & multiplication by allocation memory for an array dynamically.

15 Write a program to read marks out of 100. Declare result as follows:

a. 60 or more 1st class

b. 50-59 2nd class

c. 40-49 pass

d. Less than 40 fail

16 Write a program to check whether a year is a leap year or not.

17 Write a program to read string from console and display the number of occurrence of each word.

18 Assume that a bank maintains account for its customers; it may be saving or current. The saving account provides compound interest and withdrawal facilities but not cheque book. The current account provides cheque book but no interest. Current account holders should also maintain a min balance & if the balance falls below, a service charge is imposed. Perform the problem by using the switch cases. Include the necessary methods in order to achieve the following tasks inside switch case:

a) Accept deposit from a customer and update the balance

b) Display the balance.

c) Compute and deposit interest

d) Permit withdrawal and update the balance.

e) Check for the minimum balance, impose penalty. If necessary, and update the balance.

Display all the information.

19 Write a program to calculate the area of two different rectangle using class & objects.

20 Perform the Q. No. 21 by introducing methods for initializing the values and for calculating the area.

21 Perform the Q. No. 21 by introducing constructor for initializing the values.

22 Write a program to perform the Stack operations using class & objects.

23 Write a program to calculate the Volume of rectangle and cube using method overloading.

24 Perform the Q. No. 25 using constructor overloading.

25 Write a program to show pass by value and pass by reference.

26 Write a program to show how object and be returned.

27 Perform the Q. No. 7 using class, object and recursion.

28 Write a program to show how static can be used in java.

29 Input two one dimensional arrays A and B which are in ascending order. Write a program to merge them into a single sorted array C that contains every item from array A and B in ascending order.

30 Write a program to accept the shopping list of 5 items and stores them in a vector to accomplish the following task.

1. Delete an item from the list.
2. Add an item at a specified location in the list.
3. Add item at the end of the list.

Print all the desired information. Perform the task using class & objects.

31 Assume that the bank maintains two kinds of account. One called Saving Account and the other is Current Account. The saving account provides compound interest and withdrawal facility but no cheque book facility. The current account provides cheque book facility and withdrawal facility but no interest. Current account holders should also maintains a minimum balance and if the balance falls below this level, a service charge is imposed.

Create a class Account that stores customer name, account number, and the type of account. From this derive the class curr_acct and sav_acct to make them more specific to their requirement. Include the necessary methods in order to achieve the following task.

- Accept deposit from customer and update the balance.
- Display the balance.
- Permit withdrawal and compute the balance.
- Check for minimum balance, impose penalty if necessary and update the balance.

Display all the desired information.

32 Write a program to show the use of super.

33 Assume that the publishing company markets print books and digital books. Create a class named Publication with data members named title, price and authors name. from Publication class derive two classes named Books and Ebooks. The class adds a page count data member named pcount while Ebook adds data member playing time name ptime. Each of the classes must have member functions getdata() to read class specific data from keyboard and displaydata() to output the class specific data to the computer screen. Write a Program to test these classes.

34 Assume that a shape interface contains the data members PI and functions area () and perimeter (). Implement these two methods according to type of shape like circle, rectangle and square classes.

35 Assume that binary interface contains the method: binary to decimal, decimal to binary, two's complement and binary addition. Create the appropriate classes to implement these methods.

36 Write a program to display the use of all access modifiers with the help of two packages

37 Design a package to contain the class student and another package that contains the interface sports. Write a program to display the Rollno, Paper1, Paper2 and total score of the candidates.

38 Write a program to show the use of simple try/catch statement.

39 Write a program to show the use of nested try/catch statements.

40 Write a program to show the use of "throw", "throws" and "finally" keyword.

41 Write a program to create a custom exception. Show its use with the help o java program.

42 Write a program to read two integer number and calculate the division of these two numbers, throw an exception when wrong type of data is keyed in. and also maintain a try block to detect and throw exception if condition “divide by zero” occurs.

43 Define an exception called “NoMatchException” that is thrown when a string is not equal to “India”. Write a program that uses this exception.

44 Write a program to copy characters from one file into another using character streams

45 Write a program to write bytes to a file.

46 Write a program to read bytes from file by using program no 47.

47 Write a program to create a sequential file that could store details of five students. Details include id, name, class, semester, three subject marks. Compute and print students information and their total marks.

48 Write a program to show reading and writing with random access file. At the same time append some text to a file.

49 Write an applet program to print Hello.

50 Write an applet program to print Hello by passing parameter.

51 Write a program to perform the arithmetic operations by using interactive inputs to an applet.

52 Write a program to draw various shapes (at least 5) using methods of graphics class.

53 Write an applet program to draw bar charts.

Year	2009	2010	2011	2012	2013	2014
Turnover (Rs. Crores)	110	150	135	200	210	185

53 Write an applet program to insert image, audio and video data.

54 Write a program to illustrate the use of multithreading. Also set priorities for threads.

55 Write a program that connects to a server by using a socket and sends a greeting, and then waits for a response.

56 Write a program to create server application that uses the Socket class to listen for clients on a port number specified by a command-line argument:

57 Write a program to show the use of methods of the ArrayList and LinkedList classes.

58 Write a program to show how Vector class can be used.

59 Write a program to search an element in a collection using binarySearch method.

60 Write a program to create a file using text fields in windows.
a. TextFiled: Roll_number, Name and marks.
b. Button: enter and done.
c. Labels: Roll Number, Student Name and Marks.

61 Write a program to read the file using text fields from program no 63.

62 Write a program depicting the usages of keyboard event in an applet.

63 Write a program to expand ring on mouse click.

64 Write a program to create a simple notepad in windows. Add more modules to the notepad as per your intelligence.

Examination Scheme:

IA				**EE**	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ADVANCED DATABASE MANAGEMENT SYSTEM LAB

Course Code	L	T	P	Credit	Semester
MCA123	-	-	2	1	I

Course Learning Outcomes:

1. Describes Basic Elements of SQL.
2. Work with different types of SQL Statements Data Query Language (DQL) Data Definition
3. Language (DDL) Data Manipulation Language (DML) and understand that PL/SQL provides programming extensions to SQL
4. Design PL/SQL program units that execute efficiently and work with Stored Procedures and Functions
5. Understand Triggers and Cursor concepts

INSTRUCTIONS TO STUDENTS

1.Students should be regular and come prepared for the lab practice.

2. In case a student misses a class, it is his/her responsibility to complete that missed experiment(s).

3. Students should bring the observation book, lab journal and lab manual. Prescribed textbook and class notes can be kept ready for reference if required.

4. They should implement the given experiment individually.

5. While conducting the experiments students should see that their programs would meet the following criteria:

- Programs should be interactive with appropriate prompt messages, error messages if any, and descriptive messages for outputs.
- Programs should perform input validation (Data type, range error, etc.) and give appropriate error messages and suggest corrective actions.
- Comments should be used to give the statement of the problem and every function should indicate the purpose of the function, inputs and outputs
- Statements within the program should be properly indented
- Use meaningful names for variables and functions.
- Make use of Constants and type definitions wherever needed.

6. Once the experiment(s) get executed, they should show the program and results to the instructors and copy the same in their observation book.

7. Questions for lab tests and exam need not necessarily be limited to the questions in the manual, but could involve some variations and / or combinations of the questions.

LAB CONTENTS

SL NO. TITLE OF EXPERIMENT WEEKS

1. SQL BASICS 2 weeks
2. Analyzing given system and preparing ERmodel and converting it to relational schema. 1 week
3. SQL Advanced Commands 2 weeks
4. PL/SQL BASICS & Cursor 1 week
5. Cursors continued & exception handling 1 week
6. Triggers 1 week
7. Procedures, Functions, Packages 2 weeks
8. Interfacing DB with any latest front end 1 week
9. Implementation 1 week

LIST OF PROGRAMS

1. Week 1 SQL

1.1 Create table EMP with following columns and constraintsNote:

Note: Give descriptive enough name to the constraints

Name	Type	Constraint
EMPNO	NUMBER(4)	Make this as primary key after creating table
ENAME	VARCHAR2(10)	
JOB	VARCHAR2(9)	CLRK/MGR/A.MGR/GM/CEO, default CLRK
MGR_ID	NUMBER(4)	References EMP
DATE_BIRTH	DATE	Must be less than joining Date
SAL	NUMBER(7,2)	More than 20000,default 20001
COMM	NUMBER(7,2)	DEFAULT 1000
DEPTNO	VARCHAR2(3)	References DEPT
DATE_OF_JOIN	DATE	

Add a primary key constraint to EMP table after creating the table

1.2 Create table DEPT with following columns and constraints

Name	Type	Constraint
DNO	VARCHAR2(3)	Primary Key and Starts from 'D'
DNAME	VARCHAR2(10)	Unique
LOCATION	VARCHAR2(9)	BNG/MNG/MUB/HYD/CHN, default BNG

1.3 Create table PROJECTs with following constraints

Combination of DNO and PRJ_NO is primary key

Name	Type	Constraint
DNO	VARCHAR2(3)	References DEPT ,NOT NULL
PRJ_NO	VARCHAR2(5)	Starts from 'P' , NOT NULL
PRJ_NAME	VARCHAR2(10)	
PRJ_CREDITS	NUMBER(2)	Range from 1 to 10
STRT_DATE	DATE	
END_DATE	DATE	END_DATE > START_DATE

Add a column to EMP table named PRJ_ID. Add a foreign key constraint to EMP table on (DeptNo,Proj_Id) referencing PROJECTS. Indicates -an employee from which department is working on which project/s.

1.4 Insert records into EMP table

In the following records take any valid values to the columns left blank, columns with null must be entered with null values only

Empno	Ename	Job	MgR_ID	Date_ofBirth	Sal	comm	Deptno	Prj_Id	Dateofjoin
100	Ravi	MGR	111	10-10-1985	32000		D1	P1	2-10-2001
102	Raviraj	CLRK	100	10-12-1980	24000		D1	P3	12-11-2000
111	Raghu	GM	150	10-12-1974	45000	15000	null	null	3-12-1985
150		CEO	null	10-12-1970	60000	30000	null	null	3-12-1990
103		A.CLRK	111	10-12-1980			D1	P1	2-10-2001
103		CLRK	111	2-10-1980			D1	P3	2-10-2002
125	Manu	A.MGR	150	10-12-1980			D4	P2	2-10-2002
104		CLERK	100	2-10-1980			D2	P1	2-10-2005
106		MGR	100	2-10-1986			D2		2-10-1985
123	Mahesh	CLRK	106	10-12-1974	25000		D3	P2	2-10-2002
108		CLRK	106	10-12-1970			D9		2-10-1985
103		CLRK	111	10-12-1980			D1	P3	2-10-2001
null		CLRK	106	10-12-1980	18000				10-12-1980

1.5 Insert records into DEPT table

DNO	DName	Location
D1	Marketing	CHN
D2	Research	MNG
D3	Administrator	BNG
D4		BGG
D5	IT	BNG
Null	Corporate	HYD

Write the reason if some records are not inserted. Insert your own 2 records

1.6 Insert records into PROJECTS

Dno	Prj_No	Prj_Name	Prj_Credits
D1	P1		2
D2	P1		2
D3	P2		7
D1	P3		5
D4	P2		7

Insert your own 2 records

2. Week 2

2.1 Display all records from EMP,DEPT and PROJECTS table

2.2 Display records of Employees who have salary more than 25000 or working in department D2

2.3 Delete employee records working on project P2 and confirm the result. Type ROLLBACK to restore records back if records are deleted.

2.4 Delete department Marketing from DEPT table, confirm the result with reason. Type ROLLBACK to restore records back if records are deleted.

2.5 Delete records of employees working under Manger with ID 100 and in project P1.

2.6 Update the DNO of first record in PROJECTS to D5, confirm the result with reason.

2.7 Update the Job of employee with EmpNo 123 to MGR, salary to 35000 and his manager as 111.

2.8 List all employee names and their salaries, whose salary lies between 25200/- and 35200/- both inclusive.

2.9 List all employee names reporting to employees 100,125,150

2.10 List all employees whose name starts with either M or R.

2.11 List the name of employees whose name do not starts with M.

2.12 List all kind jobs available in employee table, avoid displaying duplicates.

2.13 List minimum, maximum, average salaries in company.

2.14 Display the number of employees working in each project.

2.15 List the Employees name and their manager's names

2.16 List Employees Name, their department name and Projects Name in which they are working.

2.17 List the employee names, salary of employees whose first character of name is R, 2nd and 3rd characters are 'v','i' and remaining characters are unknown.

3. Week 3

3.1 List the Projects name undertaken by Marketing Department.

3.2 Display current date, 53, absolute value of -45 and current date as date with format MONTH-YY.

3.3 Display the employees name and salary in descending order by salary.

3.4 List the name of departments which are working with more than 1 project

3.5 Display department name, Max salary and Min salary in each department.

3.6 List the employees whose experience is more than 5 years.
3.7 List the Employees number, Name and their Age and retirement date(assume 60 years retirement age).
3.8 List the Employees who born on December month.
3.9 List the Employees names who born on a given year.
3.10 List the Employees names who joined on day 12.
3.11 List the Employees names having service experience more than 10 years.
3.12 List the projects which have duration more than 1 year.
3.13 List the Employees Name who is working at Locations (BNG,MUB,HYD)7
3.14 Update the COMM column of EMP table based on the SAL. Use COMM=CMM+SAL*10/100
3.15 List employee names, padded to right with a series of three periods and space up to a width of 30, and project credits of projects in which they are working.(Use RPAD,LPAD)
3.16 List the name of employees who are working in project with credit more than 7 and display name with only first letter capital and replace the character 'a'(if present) in the name by '$'.
3.17 Display department Name and Total amount spent on each department by the company as Salary.
3.18 List Employee numbers, SAL *12 (rename as ANNUAL_SAL), SAL*12 *0.1 (as TAX) , display ANNUAL_SAL and TAX in the format of $12,34,456.90.
4. Week 4
Analyzing the given system and designing ER –Model and converting the ER-model to relational scheme and implementing in Oracle. Listing the functionalities to be implemented and designing application logic(pseudo code) for the functionalities.
5. Week 5
5.1 List Job category and total salary paid for the each jobs category by the company
5.2 Display name of the department from which maximum number of employees are working on project P1
5.3 Display department names and number of CLRK working in the departments.
5.4 Display Employee names who are not working in any of the projects.
5.5 Create a View EMP_PRJ_VW to display records of employees of 'marketing' department and project in which they are working.
5.6 Display employee names and projects in which they are working using ViewEMP_PRJ_VW
5.7 Insert a record into View EMP_PRJ_VW and check the underlying tables for result and confirm result with reason.
5.8 Create an unique index on the column name DNAME on DEPT table
5.9 Create an index on the columns (name and job) on EMP table.
5.10 Create a Sequence STUD_SEQ which starts from 100 to 999 with increments of 3.
5.11 Create a table STUD with columns ROLLNO and Name. Insert ROLLNO values by taking values from STUD_SEQ.
5.12 Display Location of department and Employees name working in Marketing department or Research (using set operator).
5.13 Display the names of the Departments undertaking both projects P1 and P3 (using set operator). 8
6. Week 6 - PL/SQL
6.1 Write a PL/SQL block to insert row into EMP table.
6.2 Write a PL/SQL block for performing money withdrawal operation. Assume that the account has to maintain minimum 2000/- always. Assume current balance is 5000/- display the message- 'WITHDRAWAL COMPLETED' if new balance after withdrawal is >= 2000 otherwise 'WITHDRAWAL NOT COMPLETED'
6.3 Write a PL/SQL block to check an input string is palindrome or not palindrome.
6.4 Write a PL/SQL block to reverse a given number.
6.5 Write a PL/SQL block to accept employee number and display Employee Name, salary of employees in the format – 'RAVI draws 32000/- as salary'

6.6 *Write a PL/SQL block to input employee number and display employee name, department name and project name on which employee is working for the given employee number.

6.7 Write a PL/SQL block to display ENAME and SAL of all employees drawing salary more than 30000/-.

6.8 Do the exercise 6.7 using cursor for loop.

7. Week 7

7.1 Write PL/SQL block to give salary hike of 10% to first five highest paid employees, create a save point for salary hike given to each of five employees Calculate total amount paid by the company as salary to all employees and it should not exceed 500000/-(this amount can be assumed suitably). If it exceeds, rollback up to the recent previous save point and check again to know whether total salary lies below 500000/- and so on. Commit the changes if total salary lies below 500000/-.

7.2 *Write a PL/SQL block to process Pay roll of all Employees by calculating Bonus(considering Project Credits of projects in which they are working),HRA,PF,TAX,GROSS and NET_SAL. Insert these salary details into a new table PAYROLL(EmpNo, Pay_Date, Salary, Bonus, HRA, GROSS,PF, TAX, NET_SAL). Note Salary is same as Sal from EMP table, Bonus=Salary*Proj_Credits/100, HRA=10% of Salary, PF=10% of Salary GROSS=Salary +Bonus + HRA, TAX=10% of GROSS, NET_SAL=GROSS-PFTAX.(Hint: use two cursor one for EMP and another for different projects and their credits)

7.3 Write a PL/SQL block (using parameterized cursor) to display first two employees details (Name, Salary, Department Name) in ascending order by their salary and working in Project P1. 7.4 Write a PL/SQL block to accept, Principle, Interest rate and duration (in years) to calculate Interest to be paid. Handle the exceptions if Principle <=1000, interest rate <5 , year <1 and display proper error message for each.9

7.5 Write a PL/SQL block to accept employee number from user and display employee details such as Empno, Name, and Sal. Handle the exception raised –
(i) If user entered a non–existing employee number.
(ii) If the salary more than 25000/-
If employee exists and salary is less than 25000/- then update that salary to 25000/-

7.6 When the oracle looks for the exception OTHERS and give an example for a PL/SQL block where OTHERS is used and explain it.

7.7 * Write a PL/SQL block to insert record into EMP table with exception handling for oracle error numbers ORA-01438,ORA-01722,ORA-00904 and display proper error messages. ORA-01438 –if salary value entered more than given digits width.ORA-01722 – if a character value is inserted into Salary (or to any numeric value column) ORA-00904 – if column name entered is incorrect.

8. Week 8

8.1 Write a PL/SQL trigger to fire when there is an updation of salary of any Empno and record the Empno, Dept. Name and Old Salary, date on which salary is modified and user name who modified information in the table SAL_MOD (Empno, Dname, Old_Sal, Mod_Date, Modifier)

8.2 Write a PL/SQL trigger to fire when there is an insert /update/deletes operation on EMP table; record the information in AUDIT_EMP table which has same structure as that of EMP along with a new column OPERATION (storesUPDATE/INSERT/DELETE depending on operation being done.)

8.3 Write a PL/SQL block trigger to do INSERT/UPDATE/DELETE operation onlyduring week days. Raise an exception if the day is SAT or SUN and also display user name who initiated operation.

8.4 Write a PL/SQL block trigger to check existence of child records in EMP table on Performing DELETE operation on DEPT table. If child records exists display message and cancel the delete operation otherwise perform delete operation.

8.5 Do the program 4.16 using INSTEAD OF option.

8.6 *Write PL/SQL block trigger to insert a record into a view EMP_DEPT_VIEW. Create the view containing EMPNO, ENAME, DATE_OF_BIRTH DEPTNO, and DNAME. Use INSTEAD OF option with trigger to make records to insert into underlying tables.

9. Week 9

9.1 Write a procedure to calculate simple interest, taking principle, rate and year as inputs.

9.2 Write a procedure to take SAL of given Employee as input and calculate HRA, PF,DA, GROSS, TAX and NETSAL and return them to calling PL/SQL block(take EMPNO as keyboard input to get SAL)

9.3 Write a function to calculate square of a number and return calculated value to calling PL/SQL block.

9.4 Write two functions to calculate age and service experience of all employees and return these values to calling PL/SQL block and display.

9.5 Write functions to find department name and number of projects it is handling.Display this information in the calling PL/SQL block.

9.6 Write a package containing procedure to calculate area of circle, perimeter and a function to find factorial of a number.

9.7 Write a package containing a procedure to display Employee name, department name, immediate superior name and a function to display retirement date by considering date of birth and retiring age as 65 years.

10. Week 10

Interfacing Oracle database with any latest front end and prepare GUI layout prototypes for the system under consideration.

11. Week 11

Implementing GUI layouts and application logic for the system under consideration.

12. Week 12

Completing the implementation of application for system under considerations andvalidation, basic functionality testing.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

MOBILE COMPUTING

Course Code	L	T	P	Credit	Semester
MCA131	2	1	-	3	I

Course Learning Outcomes

CLO1: Able to understand the mobile computingprincipals and its applications in our world

CLO 2: To understand how mobile computing worksby understanding various concepts behind it and how they can be implemented for real world problems

CLO 3: To understand use of mobile computing that has been used to speedup smart connectivity, mobile apps development, arrange code more systematically, and easy to debug and studying concepts from linguistics and philosophy to computer science.

CLO 4: To be able to understand mobile computing applications and how it can be use in real world applications to benefit us.

Course Contents:

Module I:
Global System for Mobile Communication (GSM) system overview: GSM Architecture, Mobility management, Network signalling. GSM Additional services: Teletext, Facsimile, Videotext services.

Module II: (Wireless) Medium Access Control
Motivation for a specialized
MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.
Mobile Network Layer: Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

Module III: Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

Module IV: Mobile Data Communication
W LANs (Wireless LANs) IEEE 802.11 standard, Mobile IP.
Third Generation (3G) Mobile Services: Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G.

Module V: Global Mobile Satellite Systems
Mobile Satellite Systems (GEO, MEO and LEO), case studies of the IRIDIUM and GLOBALSTAR systems.

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- "Mobile Communications", 2nd Edition, Jochen Schiller,2003

References:

- "Wireless and Mobile Networks Architectures", by Yi-Bing Lin &ImrichChlamtac, John Wiley & Sons, 2001.
- "Mobile and Personal Communication systems and services", by Raj Pandya, Prentice Hall of India, 2001.
- "Third Generation Mobile Telecommunication systems", by P. Stavronlakis, Springer Publishers, 2001.

THEORY OF COMPUTATION

Course Code	L	T	P	Credit	Semester
MCA 132	2	1	-	3	I

Course Learning Outcomes:

1. Design deterministic and non-deterministic finite state machines and understand their capabilities and limits
2. Design deterministic and non-deterministic context-free grammars and pushdown automata
3. Design and analyze Turing machines, their capabilities and limitations
4. Demonstrate the understanding of complexity classes and current unsolved problems in theoretical computer science
5. Apply the theoretical concepts to the practice of program design with regular expresisons, parsing, and complexity analysis

UNIT-I

Theory of Automata: Definition of an Automaton, Description of a Finite Automation, Transition Systems, Properties of Transition Functions, Acceptability of a String by a Finite ,Automation, Nondeterministic Finite State Machines, The Equivalence of DFA and NDFA, Mealy and Moore Models, Minimization of Finite Automata Exercises

UNIT-II

Formal Language: Basic Definitions and Examples, Chomsky Classification of Languages, Languages and Their Relation, Recursive and Recursively Enumerable Sets, Operations on Languages, Languages and Automata

UNIT-III

Regular Sets and Regular Grammars: Regular Expressions ,Finite Automata and Regular Expressions, Pumping Lemma for Regular Sets, Application of Pumping lemma, Closure Properties of Regular Sets, Regular Sets and Regular Grammars

UNIT-IV

Context-Free languages and Pushdown Automata: Context-free languages and Derivation Trees, Ambiguity in Context free Grammars, Simplification of Context-free Grammars, Normal Forms, Pumping Lemma and Decision Algorithms for context free languages, Basic Definitions of Pushdown Automata, Acceptance by pda , Pushdown Automata and Context free Languages, Parsing and Pushdown Automata

UNIT-IV

Turing Machines and Linear Bounded Automata: Turing Machine Model, Representation of Turing Machines, Language Acceptability by Turing Machines, Design of Turing Machines, Universal Turing Machines and Other modifications, The Model of Linear Bounded Automaton, Turing Machines and Type 0 Grammars, Linear Bounded Automata and languages, Halting Problem of Turing Machines, NP-Completeness.

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text Books:

- Mishra K.L.P. and N. Chandrasekaran : Theory of Computer Science (Automata, Languages and Computation), Prentice Hall of India, New Delhi, 2005.
- John C Martin, "Introduction to Languages and the Theory of Computaiton", Third Edition, Tata McGraw Hill Publishing Company, New Delhi, 2007. (UNIT 4, 5)

- Hop croft J.E. Motwani R. and Ullman J.D. “Introduction to Automata Theory, Languages and Computations”, Second Edition, Pearson Education, 2008. (UNIT 1, 2, 3)

References Books:

- Mishra K L P and Chandrasekaran N, “Theory of computer Science-Automata, Languages and Computation”, Third Edition, Prentice Hall of India, 2004.
- Harry R Lewis and Christos H Papadimitriou, “Elements of the Theory of Computation”, Second Edition, Prentice Hall of India, Pearson Education, New Delhi, 2003.
- Peter Linz, “An introduction to Formal Language and Automata”, Third Edition, Narosa Publications, New Delhi, 2002.
- Kamla Krithivasan and Rama. R, “introduction to Formal languages, Automata Theory and Computation”, Pearson Education 2009.

ANALYSIS AND DESIGN OF ALGORITHMS

Course Code	L	T	P	Credit	Semester
MCA 133	2	1	-	3	I

Course Learning Outcomes:

1. **Analyze the asymptotic performance of algorithms.**
2. **Write rigorous correctness proofs for algorithms. Demonstrate a familiarity with major algorithms and data structures.**
3. **Apply important algorithmic design paradigms and methods of analysis.**

Course Contents:

Module I: Algorithm Analysis

Introduction Algorithms Complexity measures, Best, worst and average-case complexity functions, problem complexity, quick review of basic data structures and algorithm design principles.

Module II: Sorting and searching Order statistics

Sorting by selection, insertion and bubble, Divide & Conquer Strategy, Heap Sort, Quick Sort Data Sorting in Linear time. other sorting algorithms— radix sort, merge sort, sternsons Matrix Multiplication.

Searching in static table— binary search, path lengths in binary trees and applications, optimality of binary search in worst cast and average-case Binary search trees, construction of optimal weighted binary search trees; Searching in dynamic table -randomly grown binary search trees, AVL and (a, b) trees. Hashing: Basic ingredients, analysis of hashing with chaining and with open addressing.

Module III: Advanced Design and Analysis Techniques

Dynamic programming- Elements of dynamic programming, Chain-matrix multiplication, All pair shortest path (Flayed -algorithm), Optimal Binary Search Tree.

Greedy algorlthms- Elements of the greedy strategy, Huffman codes, Single-source shortest path in a directed graph, Knapsack problem.

Module IV: Graph Algorithms

Elementary graphs Algorithms, Minimum spanning Trees minimum spanning trees— Kruskal's and Prim's algorithms— Johnson's implementation of Prim's algorithm using priority queue data structures, Single source Shortest paths, All Pair Shortest Paths. *String processing* : String searching and Pattern matching, Knuth-Morris-Pratt algorithm and its analysis**.**

Module V : NP-completeness

Informal concepts of deterministic and nondeterministic algorithms, P and NP **,** NP-completeness, statement of Cook's theorem, some standard NP-complete problems, approximation algorithms.

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text Books:

- T. H. Cormen, C. E. Leiserson and R. L. Rivest: Introduction to Algorithms, Prentice Hall of India, New Delhi, 1998.
- E. Horowitz and S. Sahani: Fundamental of Computer Algorithms, Galgotia Pub. /Pitman, New Delhi/London, 1987/1978.

References Books:

- A. Aho, J. Hopcroft and J. Ullman; The Design and Analysis of Computer Algorithms, A. W. L, International Student Edition, Singapore, 1998
- S. Baase: Computer Algorithms: Introduction to Design and Analysis, 2nd ed., Addison-Wesley, California, 1988.
- K. Mehlhom: Data Structures and Algorithms, Vol. 1 and Vol. 2, Springer-Verlag, Berlin, 1984.
- A. Borodin and I. Munro: The Computational Complexity of Algebraic and Numeric Problems, American Elsevier, New York, 1975.
- D. E. Knuth: The Art of Computer Programming, Vol. 1, Vol. 2 and Vol. 3. Vol. 1, 2nd ed., Narosa/Addison-Wesley, New Delhi/London, 1973; Vol. 2: 2nd ed., Addison-Wesley, 18 London, 1981; Vol. 3: Addison-Wesley, London, 1973.
- S. Winograd: The Arithmetic Complexity of Computation, SIAM, New York, 1980.

COMPUTER GRAPHICS

Course Code	L	T	P	Credit	Semester
MCA 134	2	1	-	3	I

Course Learning Outcomes:

CO 1 – Explain the applications, areas, and graphic pipeline, display and hardcopy technologies.
CO 2 – Apply and compare the algorithms for drawing 2D images also explain aliasing, anti aliasing and half toning techniques.
CO 3 – Discuss OpenGL application programming Interface and apply it for 2D & 3D computer graphics.
CO 4 – Analyze and apply clipping algorithms and transformation on 2D images.
CO 5 – Solve the problems on viewing transformations and explain the projection and hidden surface removal algorithms.

Course Contents:

Module I

Overview of Graphics System : Video Display Devices, Raster Scan Display, Random Scan Display, Input Devices, Graphic Software Output Primitives **:**Points and Lines, Line-Drawing Algorithm, Circle Generation Algorithms, Ellipse Generation Algorithm, Conic Section, Polynomial and Spline Curves, Pixel Addressing, Filled Area Primitives, Fill Area Functions.

Module II

Two Dimensional Geometric Transformation : Basic Transformations, Motion Representation, Composite Transformation, Translation, Rotation, Scaling, General Pivot-Point Rotation, General Fixed Point Scaling, General Scaling Directions, Reflection, Shear, Transformation between Co-ordinate System, Affine Transformations, Raster Methods for Transformations

Two-Dimensional Viewing **:**The Viewing Pipeline, Viewing Coo-ordinate Reference Frame, Window to New Port Co-ordinate Transformation, Two Dimensional Viewing Functions, Clipping Operations, Line Clipping, Polygon clipping.

Module III

Three Dimensional Concepts : Three Dimensional Display Methods.Parallel Projection,Perspective Projection, Depth Cueing, Visible Line and Surface Identification, Surface Rendering Three Dimensional Geometric and Modeling Transformations **:**Translation, Rotation, Scaling, Other Transformations, Composite Transformer.

Module IV

Visual- Surface Detection Methods : Classification of Visiting Surface Detection Algorithm, Back Pace Detection, Depth-Buffer Method, A Buffer Method, Scan-Line Method

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text Books:

1. Computer Graphics, Donald Hearn, M Pauline Baker, 2nd Edition, PHI 1999
2. Schaum Series**,** Computer Graphics

References Books:

1. Computer Graphics, N. Krishnamurthy, TMH

DATA WAREHOUSING AND DATA MINING

Course Code	L	T	P	Credit	Semester
MCA 135	2	1	-	3	I

Course Learning Outcomes:

1 Be familiar with mathematical foundations of data mining tools.
2 Understand and implement classical models and algorithms in data warehouses and data mining.
3 Characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering.

Course Contents:

Module I: Data Warehousing

Introduction to Data Warehouse, its competitive advantage, Data warehouse vs Operational Data, Things to consider while building Data Warehouse

Module II: Implementation

Building Data warehousing team, Defining data warehousing project, data warehousing project management, Project estimation for data warehousing, Data warehousing project implementation

Module III: Techniques

Bitmapped indexes, Star queries, Read only tablespaces, Parallel Processing, Partition views, Optimizing extraction process

Module IV: Data Mining

From Data ware housing to Data Mining, Objectives of Data Mining, the Business context for Data mining, Process improvement, marketing and Customer Relationship Management (CRM), the Technical context for Data Mining, machine learning, decision support and computer technology.

Module V: Data Mining Techniques and Algorithms

Process of data mining, Algorithms, Data base segmentation or clustering, predictive Modeling, Link Analysis, Data Mining Techniques, Automatic Cluster Detection, Decision trees and Neural Networks.

Module VI: Data Mining Environment

Case studies in building business environment, Application of data ware housing and Data mining in Government, National Data ware houses and case studies.

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Data Warehousing, Data Mining & OLAP, Alex Berson, Stephen J. Smith, Tata McGraw-Hill Edition 2004.
- Data Mining: Concepts and Techniques, J. Han, M. Kamber, Academic Press, Morgan Kanf man Publishers, 2001
- Data Ware housing: Concepts, Techniques, Products and Applications, C.S.R. Prabhu, Prentice Hall of India, 2001.

References:

- Mastering Data Mining: The Art and Science of Customer Relationship Management, Berry and Lin off, John Wiley and Sons, 2001.
- Data Mining", Pieter Adrians, Dolf Zantinge, Addison Wesley, 2000.
- Data Mining with Microsoft SQL Server, Seidman, Prentice Hall of India, 2001.

OPEN SOURCE TECHNOLOGIES

Course Code	L	T	P	Credit	Semester
MCA 136	2	1	-	3	I

Course Learning Outcomes:

1. Understand what an open source project is
2. Know how to use common open source tools
3. Be able to find and contribute to open source projects
4. Create and lead an open source project

Course Contents:

Module – I Introduction to XML

The Difference Between XML and HTML, Predefined Tags, Extensible, Transaction Data, XML Tree, Tree Structure, XML Document, Syntax Rules, XML Prolog, Case Sensitive, Attribute and Values, Comments, Well Formed XML, XML Elements, Empty XML, XML Naming Rules, Extensible, XML Attributes, Elements vs. Attributes, Displaying XML, Viewing XML Files,

Module – II XHTML and DTD

XHTML –eXtensible HyperText Markup Language, Basic syntactic rules, General format, XHTML validation, XML DTD, Building Blocks of XML Documents, Elements, Attributes, Entities, PCDATA, CDATA, #REQUIRED, #IMPLIED, #FIXED, Elements vs. Attributes, Entities, Internal Entity Declaration, External Entity Declaration, Internal DTD Declaration, External DTD Declaration

Module – III XML Schemas & Parser

Introduction to XML Schemas, need XML Schemas, Structure of a Schema, XML Schema Components, XSD document, Reference, Simple, XML Abstract Data Model, XML document & XML Schema, Simple Type Definition VS. Complex Type Definition, Simple Types, Complex Types, Parser, DOM, SAX

Module – IV XSS, XSL & XSLT

XSLT Introduction, Transformations, Create an XSL Style Sheet, Link the XSL Style Sheet to the XML Document, XSLT Element, xsl:for-each, xsl:value-of, xsl:template, xsl:sort, xsl:if, xsl:choose, XPath, XML Schema, Element, Default and Fixed Values Data Types, Syntax, Attributes, Restrictions/Facets, XML Parser, XML DOM,HTML DOM, XML and XPath, XSLT, Displaying XML with XSLT, XSLT Stylesheet,

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Beginning XML Paperback – Joe Fawcett, Danny Ayers),Liam R. E. Quin

References:

- Beginning XML, 5th Edition, Danny Ayers, Joe Fawcett, Liam Quin
- Rockley, A., & Cooper, C. (2012). Managing enterprise content: A unified content strategy (2nd ed.). Berkeley, CA: New Riders.
- Rosenfeld, L., Morville, P. & Arango, J. (2015). Information architecture: for the Web and beyond. (4. ed.) Sebastopol: O'Reilly.

NETWORK FUNDAMENTAL

Course Code	L	T	P	Credit	Semester
MCA137	2	1	-	3	I

Course Learning Outcomes:

1. Demonstrate use of networking mathematics, terminology, and models.
2. Explain the fundamental principles and concepts of the seven-layer OSI model.
3. Analyze and troubleshoot multiple-layer problems of the seven-layer OSI model for troubleshooting

Course Contents:

Module I: Living in a Network Centric World

Networks supporting the way we live, Examples of today's popular communication tools, Communication, Network as platform, The Elements of Network, Converged network
The Architecture of Internet, Trends in Networking.

Module II: Communicating over the Network

Introduction, LANs, WANs and Internetworks, Network Addressing

Module III: Application Layer Functionality and Protocols

Introduction, making provision for applications and services, Application layer protocols and services.

Module IV: OSI Transport Layer

Introduction, The TCP protocol –communicating with reliability, Managing TCP sessions, The UDP protocol communicating with low overheads

Module V: OSI Network Layer

Introduction, Networks-dividing host into groups, Routing –How our data packets are handled, Routing process.

Module VI: Addressing the Network - IPv4

Introduction, Address for different purpose, Assigning address, Calculating address, testing the Network layer.

Module VII: Data Link Layer

Introduction, Data Link Layer-Accessing the media .Media Access Control Techniques, Media Access Control Addressing and Framing Data.

Module VIII: OSI Physical Layer

Introduction, The Physical Layer-Communication Signals, Physical Signaling and Encoding, Representing Bits, Physical Media-Connecting Communication.

Module IX: Ethernet

Overview of Ethernet, Ethernet –Communication through the LAN, The Ethernet Frame ,Ethernet Media Access Control, Ethernet Physical Layer, Hubs and Switches, Address Resolution Protocol(ARP)

Module X: Planning and Cabling Networks

Introduction, LANs-Making the Physical connections, Device Selection Factors, Device Interconnecting ,Developing an Addressing Scheme, Calculating the subnets, Device Interconnections.

Module XI: Configuring and Testing Your Network

Configuring CISCO devices –IOS basics, applying a Basic Configuration using CISCO IOS, Verifying Connectivity, Monitoring and Documenting of Networks.

CCNA Exploration: Network Fundamentals (Guided Case Study)

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Cisco Networking Academy Programme CCNA 1 & 2 Companion Guide, 3rd Edn by Pearson Education
- Cisco Networking Academy Programme CCNA 1 & 2 Lab Companion, 3rd Edn by Pearson Education
- Cisco Networking Academy Programme CCNA 1 & 2 Engineering General, 3rd Edn by Pearson Education
- CISCO CCNA-Exploration 4.0, Module 1, Pearson Education.

References:

- Data Communicatios and Networking by Behrouz Forouzan, 3e, Tata McGraw-Hill
- Computer Networks by Andrews S. Tanenbaum, 4e, Pearson Education

Note: This is an online course of Cisco. Online materials provided by Cisco are studied.

COMPUTER GRAPHICS LAB

Course Code	L	T	P	Credit	Semester
MCA 144	-	-	2	1	I

Course Learning Outcomes:

1) Draw Geometric primitives using OpenGL
2) Execute scan line polygon filling using OpenGL
3) Implement basic transformations on objects using OpenGL
4) Implement clipping algorithm on lines using OpenGL

Course Contents:

INSTRUCTIONS TO STUDENTS

1.Students should be regular and come prepared for the lab practice.

2. In case a student misses a class, it is his/her responsibility to complete that missed experiment(s).

3. Students should bring the observation book, lab journal and lab manual. Prescribed textbook and class notes can be kept ready for reference if required.

4. They should implement the given experiment individually.

5. While conducting the experiments students should see that their programs would meet the following criteria:

- Programs should be interactive with appropriate prompt messages, error messages if any, and descriptive messages for outputs.
- Programs should perform input validation (Data type, range error, etc.) and give appropriate error messages and suggest corrective actions.
- Comments should be used to give the statement of the problem and every function should indicate the purpose of the function, inputs and outputs
- Statements within the program should be properly indented
- Use meaningful names for variables and functions.
- Make use of Constants and type definitions wherever needed.

6. Once the experiment(s) get executed, they should show the program and results to the instructors and copy the same in their observation book.
7. Questions for lab tests and exam need not necessarily be limited to the questions in the manual, but could involve some variations and / or combinations of the questions.

LAB CONTENTS

SL NO.	TITLE OF EXPERIMENT	WEEKS
1	Basic Shapes and Colors	1 week
2	Pattern creation using setfillstyle	1 week
3	Random Pattern Generation	1 week
4	Line Pattern Generation	1 week

5	Human Face Generation	1 week
6	2D Transformation – Rectangle	1 week
7	2D Transformation – Triangle	1 week
8	2D Transformation – Shearing & Reflection	1 week
9	3D Transformation – Cuboid	1 week
10	3D Transformation – Rotation about axis	1 week
11	2D Composite Transformation	1 week
12	3D Composite Transformation	1 week
13	Visible Surface Detection	1 week

Ex. No. 1

Basic Shapes and Colors

Aim:

To implement shape and color functions in the graphics.

Algorithm:

Step 1: Include the graphics header file

Step 2: Initialize graphics using initgraph()

Step 3: Draw different shapes using graphics inbuilt functions such as circle(), Ellipse(), rectangle(),outtextxy (), line(),drawpoly().

Step 4: Stop the process.

Ex. No. 2

Pattern creation using setfillstyle

Aim:

To create patterns using setfillstyle() in the graphics.

Algorithm:

Step 1: Include the graphics header file

Step 2: Initialize graphics using initgraph()

Step 3: Draw different patterns using the graphics inbuilt function setfillstyle().

Step 4: Stop the process.

Ex. No. 3

Random Pattern Generation

Aim:

To create random patterns in the graphics using random() function.

Algorithm:

Step 1: Include the graphics header file

Step 2: Initialize graphics using initgraph()

Step 3: Draw random patterns using the graphics inbuilt functions such as circle(), bar() and setfillstyle().

Step 4: Stop the process.

Ex. No. 4

Line Pattern Generation

Aim:

To generate line patterns in the graphics.

Algorithm:

Step 1: Include the graphics header file

Step 2: Initialize graphics using initgraph()

Step 3: Draw line patterns using the graphics inbuilt functions setlinestyle ().

Step 4: Stop the process.

Ex. No. 5

Human Face Generation

Aim:

To generate a human face in the graphics.

Algorithm:

Step 1: Include the graphics header file
Step 2: Initialize graphics using initgraph()
Step 3: Draw human face using the graphics inbuilt functions.
Step 4: Stop the process.

Source Code:

```
#include<stdio.h>
#include<conio.h>
#include<graphics.h>
void main()
{
int gd=DETECT,gm;
initgraph(&gd,&gm,"c:\tc\bgi");
setcolor(GREEN);
setbkcolor(0);
/*------------------CHIN----------------------*/

ellipse(298,244,160,380,60,80);

/*---------------- HAIR ----------------------*/

arc(300,219,400,140,80);
ellipse(355,190,270,438,10,28);
arc(359,188,169,265,30);
ellipse(288,190,180,360,40,20);
ellipse(239,193,96,370,8,25);

/*--------------Eye Brows----------------------*/

arc(282,255,89,130,40);
arc(278,259,80,120,40);
arc(314,255,405,92,40);
arc(319,259,420,100,40);
line(310,215,310,220);
line(284,215,284,219);

/*------------------Eyes----------------------*/

setfillstyle(SOLID_FILL,WHITE);
ellipse(320,230,0,360,10,5);
ellipse(275,230,0,360,10,5);
fillellipse(320,230,10,5);
fillellipse(275,230,10,5);
setfillstyle(SOLID_FILL,BLACK);
ellipse(320,230,0,360,4,4);
ellipse(275,230,0,360,4,4);
fillellipse(320,230,5,5);
fillellipse(275,230,5,5);

/*-----------------Nose-------------------*/

ellipse(280,220,270,0,10,40);
ellipse(315,220,180,270,10,40);
```

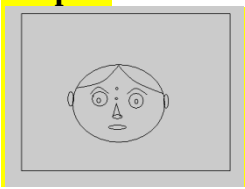
```
ellipse(285,260,100,285,8,7);
ellipse(310,260,255,70,8,7);
circle(320,230,2);
circle(275,230,2);
arc(297,257,228,689,15);
/*--------------------MOUTH--------------------*/

ellipse(298,290,0,360,30,7);
line(270,290,326,290);

/*--------------------Ears--------------------*/

ellipse(234,240,0,330,4,20);
ellipse(362,240,220,170,4,20);
getch();
closegraph();
restorecrtmode();
}
```

Output:



Ex. No. 6

2D Transformation - Rectangle

Aim:

To create a rectangle and apply 2D transformations like Scaling, Rotation and Translation.

Algorithm:

Step 1: Include the graphics header file

Step 2: Initialize graphics using initgraph()

Step 3: Initialize the variables

Step 4: Enter the choice for transformation

Step 5: If choice = 2 translation (i.e.) changing the coordinates of the object is performed

x' = x + tx

y' = y + ty

Step 6 : If choice = 3 rotation (i.e.) rotating the angle of the object is performed

x' = x*cosθ - y*sinθ

y' = x*sinθ + y*cosθ

Step 7: If choice = 4 scaling (i.e.) resizing the object is performed

x' = x * sx

y' = y * sy

Step 8: Stop the process.

Ex. No. 7

2D Transformation - Triangle

Aim:

To create a simple triangle and apply 2D transformations like Scaling, Rotation and Translation.

Algorithm:

Step 1: Include the graphics header file

Step 2: Initialize graphics using initgraph()

Step 3: Declare a structure with necessary variables and functions

Step 4: Initialize the variables

Step 5: Enter the choice for transformation
Step 6: If choice = 1 scaling (i.e.) resizing the object is performed

x' = x * sx
y' = y * sy

Step 7 : If choice = 2 rotation (i.e.) rotating the angle of the object is performed

x' = x*cosθ - y*sinθ
y' = x*sinθ + y*cosθ

Step 8: If choice = 3 translation (i.e.) changing the coordinates of the object is performed

x' = x + tx
y' = y + ty

Step 9: Stop the process.

Ex. No. 8

2D Transformation – Shearing & Reflection

Aim:

To create a simple object and apply 2D transformations like Scaling, Rotation, Translation, Shearing and Reflection.

Algorithm:

Step 1: Include the graphics header file
Step 2: Initialize graphics using initgraph()
Step 3: Initialize the variables
Step 4: Enter the choice for transformation
Step 5: If choice = 1 translation (i.e.) changing the coordinates of the object is performed

x' = x + tx
y' = y + ty

Step 6 : If choice = 2 scaling (i.e.) resizing the object is performed

x' = x * sx
y' = y * sy

Step 7: If choice = 3 rotation (i.e.) rotating the angle of the object is performed

x' = x*cosθ - y*sinθ
y' = x*sinθ + y*cosθ

Step 8: If choice = 4 shearing (i.e.) distortion of the object is performed

x' = x + sh*y1;
y' = y;

Step 9: If choice = 5 reflection (i.e.) mirror image of the object is generated
Step 10: Stop the process.

Ex. No. 9
3D Transformation - Cuboid
Aim:

To create a cuboid and apply 3D transformations like Scaling, Rotation and Translation.

Algorithm:

Step 1: Include the graphics header file
Step 2: Initialize graphics using initgraph()
Step 3: Initialize the variables
Step 4: Enter the choice for transformation
Step 5: If choice = 2 translation (i.e.) changing the coordinates of the object is performed

x' = x + tx
y' = y + ty
z' = z + tz

Step 6 : If choice = 3 rotation (i.e.) rotating the angle of the object is performed

y’ = y*cosθ - z*sinθ
z’ = y*sinθ + z*cosθ
x’ = x

Step 7: If choice = 4 scaling (i.e.) resizing the object is performed
x’ = x * sx
y’ = y * sy
z’ = z * sz

Step 8: Stop the process.

Ex. No. 10

3D Transformation – Rotation about axis

Aim:

To create a cube and apply 3D transformations like Scaling, Rotation about axis and Translation.

Algorithm:

Step 1: Include the graphics header file
Step 2: Initialize graphics using initgraph()
Step 3: Initialize the variables
Step 4: Enter the choice for transformation
Step 5: If choice = 2 translation (i.e.) changing the coordinates of the object is performed
x’ = x + tx
y’ = y + ty
z’ = z + tz

Step 6 : If choice = 3 rotation (i.e.) rotating the angle of the object is performed

About X-axis
y’ = y*cosθ - z*sinθ
z’ = y*sinθ + z*cosθ
x’ = x

About Y-axis
z’ = z*cosθ - x*sinθ
x’ = z*sinθ + x*cosθ
y’ = y

About Z-axis
x’ = x*cosθ - y*sinθ
y’ = x*sinθ + y*cosθ
z’ = z

Step 7: If choice = 4 scaling (i.e.) resizing the object is performed
x’ = x * sx
y’ = y * sy
z’ = z * sz

Step 8: Stop the process.

Ex. No. 11

2D Composite Transformation

Aim:

To create a triangle and apply 2D composite transformations like Scaling, Rotation and Translation.

Algorithm:

Step 1: Include the graphics header file
Step 2: Initialize graphics using initgraph()
Step 3: Initialize the variables
Step 4: Enter the choice for transformation
Step 5: If choice = 1 two successive translation & rotation are performed
Step 6 : If choice = 2 two successive translation & scaling are performed
Step 7: If choice = 3 two successive scaling and rotation are performed
Step 8: Stop the process.

Ex. No. 12
3D Composite Transformation
Aim:

To create a cube and apply 3D composite transformations like Scaling, Rotation and Translation.

Algorithm:

Step 1: Include the graphics header file
Step 2: Initialize graphics using initgraph()
Step 3: Initialize the variables
Step 4: Enter the choice for transformation
Step 5: If choice = 1 two successive translation & rotation are performed
Step 6 : If choice = 2 two successive translation & scaling are performed
Step 7: If choice = 3 two successive scaling and rotation are performed
Step 8: Stop the process.

Ex. No. 13
Visible Surface Detection
Aim:

To create a pyramid structure as wire frame display and detect visible surfaces.

Algorithm:

Step 1: Include the graphics header file
Step 2: Initialize graphics using initgraph()
Step 3: Initialize the variables
Step 4: Enter the choice for detection.
Step 5: Draw a wire frame pyramid structure using line() function.
Step 6 : Use scan line method to detect points to be removed.
Step 7: calculate end points x1,y1,x2,y2,x3,y3 to detect all points visible from wire frame pyramid
Step 8: Display visible surface using line() function.
Step 9: Stop the process.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

DATA WAREHOUSING AND DATA MINING LAB

Course Code	L	T	P	Credit	Semester
MCA 145	-	-	2	1	I

Course Learning Outcomes:

1 Be familiar with mathematical foundations of data mining tools.
2 Understand and implement classical models and algorithms in data warehouses and data mining.
3 Characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering.

Course Contents:

Software Required: Informatica Tool, Cognos, Todd.

List of Programmes:

1. Write a program to implement text mining.
2. Write a program to implement web mining.
3. Write a program to develop snowflake schema.
4. Write a program to develop the tree schema with the help of binary tree.
5. Write a program to implement BFS and DFS with respect to 2-D modeling.
6. Write a program to implement the basic step of informatics tool.

Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

OPEN SOURCE TECHNOLOGY LAB

Course Code	L	T	P	Credit
MCA 146	-	-	2	1

Course Learning Outcomes

CO1) Implement various applications using build systems
CO2) Understand the installation of various packages in open source operating systems
CO3) Create simple GUI applications using Gambas 3
CO4) Understand various version control systems
CO5) Understand the kernel configuration and virtual environment

Course Contents:

1. Write the process of installation of XML & DRUPAL
2. Write programs to print all details of your DTD.
3. Write a program to give demo of XSLT command.
4. Write a program sort ten number by using array.
5. Create a database in MySql and connect that database from XML.
6. Write a program to Update, insert and delete the values of table

Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

NETWORK FUNDAMENTALS LAB

Course Code	L	T	P	Credit
MCA 147	-	-	2	1

Course Learning Outcomes

Co 1) Understand the structure and organization of computer networks; including the division into network layers, role of each layer, and relationships between the layers. ·
Co2) Understand the basic concepts of application layer protocol design; including client/server models, peer to peer models, and network naming.
Co3) In depth understanding of transport layer concepts and protocol design; including connection oriented and connection-less models, techniques to provide reliable data.

Course Contents:

1.0 Data Stream Capture

- Capture or download an audio stream
- Record the characteristics of the file
- Examine data transfer rates associated with the file

2.0 Observing TCP and UDP using Netstat

- Explain common **netstat** command parameters and outputs.
- Use **netstat** to examine protocol information on a pod host computer.

3.0TCP/IP Transport Layer Protocols, TCP and UDP

- Identify TCP header fields and operation using a Wireshark FTP session capture.
- Identify UDP header fields and operation using a Wireshark TFTP session capture

4.0 Application and Transport Layer Protocols Examination

- Configure the host computer to capture Application layer protocols.
- Capture and analyze HTTP communication between the pod host computer and a web server.
- Capture and analyze FTP communication between the pod host computer and an FTP server.
- Observe TCP establish and manage communication channels with HTTP and FTP connections

5.0 Examining a Device's Gateway

- Understand and explain the purpose of a gateway address.
- Understand how network information is configured on a Windows computer.
- Troubleshoot a hidden gateway address problem

6.0 Examining a Route

- Use the **route** command to modify a Windows computer routing table.
- Use a Windows Telnet client command **telnet** to connect to a Cisco router.
- Examine router routes using basic Cisco IOS commands.

7.0 Ping and Traceroute

- Use the **ping** command to verify simple TCP/IP network connectivity.
- Use the **tracert/traceroute** command to verify TCP/IP connectivity.

8.0 Examining ICMP Packets

- Understand the format of ICMP packets.
- Use Wireshark to capture and examine ICMP messages.

9.0 IPv4 Address Subnetting Scenario

When given an IP address, network mask, and subnetwork mask, you will be able to determine other information about the IP address such as:

- The subnet address of this subnet
- The broadcast address of this subnet
- The range of host addresses for this subnet
- The maximum number of subnets for this subnet mask
- The number of hosts for each subnet
- The number of subnet bits
- The number of this subnet

10.0Subnet and Router Configuration

- Subnet an address space per given requirements.
- Assign appropriate addresses to interfaces and document.
- Configure and activate Serial and FastEthernet interfaces.
- Test and verify configurations.
- Reflect upon and document the network implementation

11.0 Frame Examination

- Explain the header fields in an Ethernet II frame.
- Use Wireshark to capture and analyze Ethernet II frames

12.0 Media Connectors Lab Activity

- Test cables using a Fluke620 LAN CableMeter and a Fluke LinkRunner
- Become familiar with the most common functions of a cable tester.
- Test different cables for type and wiring problems

13.0 Address Resolution Protocol (ARP)

- Use Windows **arp** command.
- Use Wireshark to examine ARP exchanges.

14.0 Cisco Switch MAC Table Examination

- Use the Telnet protocol to log into a Cisco Switch.
- Use the Cisco IOS **show mac-address-table** command to examine MAC address and port associations.

15.0 Intermediary Device as an End Device

- Use Wireshark to capture and analyze frames originating from network nodes.
- Examine the origination of frames in a small network

16.0 Establishing a Console Session with HyperTerminal

- Connect a router and computer using a console cable.
- Configure HyperTerminal to establish a console session with a Cisco IOS router.
- Configure HyperTerminal to establish a console session with a Cisco IOS switch.

17.0 Basic Cisco Device Configuration

Configure Cisco router global configuration settings.

- Configure Cisco router password access.
- Configure Cisco router interfaces.
- Save the router configuration file.
- Configure a Cisco switch

18.0 Final Case Study - Datagram Analysis with Wireshark

- How a TCP segment is constructed, and explain the segment fields.
- How an IP packet is constructed, and explain the packet fields.
- How an Ethernet II frame is constructed, and explain the frame fields.
- Contents of an ARP REQUEST and ARP REPLY

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

REPORT ON WORKSHOP/ SOCIAL WORK

Course Code	L	T	P	Credit	Semester
MCA 151	-	-	-	1	I

Course Learning Outcomes:

CO1. Ability to be a multi-skilled with sound technical knowledge.
CO2. Ability to communicate efficiently.
CO3. Develop technical report writing and oral presentation skills
CO4. Prepare the proper documentation for report writing and oral presentation.

Rules and Regulations

- 2nd Year / 3rd Year Students for which the students and the faculty members can start preparations well in advance prior to the scheduled conference / seminar / workshop.
- The number of students going for any conference / seminar / workshop should be manageable.
- A proposal for the proposed conference / seminar / workshop should be drafted and presented to the HoI reflecting the following key points:
    - Entire activity plan
    - Route Map
    - What are the objectives for the students?
    - What they need to learn, do, and prepare before the conference / seminar / workshop?
    - List of prospective students with Contact Details
    - List of Faculty Coordinators with Contact Details
- After getting approval from the HoI, a note sheet should be prepared and all necessary permission and approval from the competent authorities should be obtained.
- The attention and co-operation of all students and parents are requested to attend the conference / seminar / workshop most effectively. Signing of the letter of Indemnity Bond (Consent-cum-Undertaking) is mandatory for all the parents of students going for conference / seminar / workshop in or outside Jaipur. Duly executed Indemnity Bond should be submitted to HoI Office at least 2 days prior to the visit, without which the accompanying Staff coordinator shall not permit the student to participate in the industrial visit
- The list of students participating in conference / seminar / workshop shall be handed over to the concerned HODs, Staff coordinators.
- Students should be present in formals.
- Students should carry the College Identity Cards during their journey.
- Discipline should be maintained during the conference / seminar / workshop. Any violation will be viewed very seriously.
- A report of the conference / seminar / workshop is to be submitted in 5 days time by students / faculty coordinators once the students are back.

The report to be prepared should reflect the following:-

- What happened at the conference / seminar / workshop the students attend and how does it relate in the best way to the preparations and the learning objectives.
- How do the students will use the outcome of conference / seminar / workshop after it is over?
- What will they gain from it and how can they set up activities that transfer the experience into learning?

- Evaluation parameters for the success of the experience of conference / seminar / workshop.

The layout guidelines for the Report:

1. File should be in the following specification:

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components:

- Front Page
- Table of Content
- Acknowledgement
- Student Certificate
- Company Profile (optional)
- Introduction
- Main Body
- References / Bibliography

ASSESSMENT OF THE INTERNSHIP FILE

The student will be provided with the Student Assessment Record (SAR) to be placed in front of the Report File. Each item in the SAR is ticked off when it is completed successfully. The faculty will also assess each item as it is completed. The SAR will be signed by the student and by the faculty to indicate that the File is the student's own work. It will also ensure regularity and meeting the delaines.

Examination Scheme:

Components	**V**	**S**	**R**	**FP**
Weightage (%)	20	20	20	40

V – Viva, S – Synopsis, FP – Final Presentation, R - Report

Anandam-I

Course Code	L	T	P	Credit	Semester
AND001	-	-	-	2	I

Course Learning Outcomes :

1. Awareness and empathy regarding community issues
2. Interaction with the community and impact on society
3. Interaction with mentor and development of Student teacher relationship
4. Interaction among students, enlarge social network
5. Cooperative and Communication skills and leadership qualities
6. Critical thinking, Confidence and Efficiency

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants,phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.
- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.
3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).

4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
6. For the topic chosen by the group, students are recommended to cover the following points:
    a) Current scenario (Regional, national and international level as applicable)
    b) Future predictions
    c) Duty of the government
    d) Government policies (related to the topic), if any
    e) Duty of public
    f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
3. Conclusion is clearly stated. The underlying logic is explicit.

COMMUNICATION SKILLS – I

Course Code	L	T	P	Credit	Semester
BCS111	1	-	-	1	I

Course Learning Outcomes:

CLO 1: Investigate strengths and personal insights to be revealed in a Formal Setupof Communication.

CLO 2: Create right selection of words and ideas while also choosing the appropriate networking channel for formalcommunication

CLO 3: Apply their acquired knowledge with the appropriate selection of channel offormal communication.

CLO 4: Develop and empower self with the power ofWords.

CLO 5: Enhance their technical writing capabilities while also learning about do's and don'ts of technical drafting.

Course Contents:

Module I: Mechanics and Semantics of Sentences
Writing effective sentences
Style and Structure

Module II: Developing writing skills
Inter - office communication: Business Letter; E mails; Netiquette
Intra – office communication: Memos, Notices, Circulars, Minutes
Report Writing

Module III: Business Presentations
Planning, design and layout of presentation
Information Packaging
Audience analysis
Audio visual aids
Speaking with confidence
Case Studies

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A
Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Krishnaswamy, N, Creative English for Communication, Macmillan
- Raman Prakash, Business Communication, Oxford.

BEHAVIOURAL SCIENCE-I
(SELF DEVELOPMENT AND INTERPERSONAL SKILLS))

Course Code	L	T	P	Credit
BSS111	1	-	-	1

Course Learning Outcomes:

1. Develop your understanding of who you are; what your core purpose is, what your values are and what limits your success
2. Manage your emotions and feelings more effectively to have the impact that you need
3. Develop the way that you regulate and control your emotions
4. Learn about your behavioral preferences to become more self-awareness. Develop and build your emotional intelligence.

Course Contents:

Module I: Understanding Self

Formation of self concept

Dimension of Self

Components of self

Self Competency

Module II: Self-Esteem: Sense of Worth

Meaning and Nature of Self Esteem

Characteristics of High and Low Self Esteem

Importance & need of Self Esteem

Self Esteem at work

Steps to enhance Self Esteem

Module III: Emotional Intelligence: Brain Power

Introduction to EI

Difference between IQ, EQ and SQ

Relevance of EI at workplace

Self assessment, analysis and action plan

Module IV: Managing Emotions and Building Interpersonal Competence

Need and importance of Emotions

Healthy and Unhealthy expression of emotions

Anger: Conceptualization and Cycle

Developing emotional and interpersonal competence

Self assessment, analysis and action plan

Module V: Leading Through Positive Attitude

Understanding Attitudes

Formation of Attitudes

Types of Attitudes

Effects of Attitude on

Behaviour
Perception
Motivation
Stress
Adjustment
Time Management
Effective Performance
Building Positive Attitude

Module VI: End-of-Semester Appraisal

Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Examination Scheme:

Components	**SAP**	**A**	**Mid Term Test (CT)**	**VIVA**	**Journal for Success (JOS)**
Weightage (%)	20	05	20	30	25

Text & References:

- Towers, Marc: Self Esteem, 1st Edition 1997, American Media
- Pedler Mike, Burgoyne John, Boydell Tom, A Manager's Guide to Self-Development: Second edition, McGraw-Hill Book Company.
- Covey, R. Stephen: Seven habits of Highly Effective People, 1992 Edition, Simon & Schuster Ltd.
- Khera Shiv: You Can Win, 1st Edition, 1999, Macmillan
- Gegax Tom, Winning in the Game of Life: 1st Edition, Harmony Books
- Chatterjee Debashish, Leading Consciously: 1998 1st Edition, Viva Books Pvt. Ltd.
- Dr. Dinkmeyer Don, Dr. Losoncy Lewis, The Skills of Encouragement: St. Lucie Press.
- Singh, Dalip, 2002, Emotional Intelligence at work; First Edition, Sage Publications.
- Goleman, Daniel: Emotional Intelligence, 1995 Edition, Bantam Books
- Goleman, Daniel: Working with E.I., 1998 Edition, Bantam Books.

FRENCH – I

Course Code	L	T	P	Credit	Semester
FLT111	2	-	-	2	I

Course Learning Outcomes:

1. Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
2. Students will be able to read and interpret small texts.
3. Students will be able to communicate in small sentences in writing, self introduction, family description etc.
4. Students will be able to communicate in small sentences in oral, self introduction, family description etc.

Course Contents:

Module B: pp. 76 – 88 Unité 6

Module C: pp. 89 to103 Unité 7

Contenu lexical: Unité 6: se faire plaisir

1. acheter: exprimer ses choix, décrire un objet (forme, dimension, poids et matières) payer
2. parler de la nourriture, deux façons d'exprimer la quantité, commander un repas au restaurant
3. parler des différentes occasions de faire la fête

Unité 7: Cultiver ses relations

1. maîtriser les actes de la communication sociale courante (Salutations, présentations, invitations, remerciements)
2. annoncer un événement, exprimer un souhait, remercier, s'excuser par écrit.
3. caractériser une personne (aspect physique et caractère)

Contenu grammatical:

1. accord des adjectifs qualificatifs
2. articles partitifs
3. Négations avec de, ne…rien/personne/plus
4. Questions avec combien, quel…
5. expressions de la quantité
6. ne…plus/toujours - encore
7. pronoms compléments directs et indirects
8. accord du participe passé (auxiliaire « avoir ») avec l'objet direct
9. Impératif avec un pronom complément direct ou indirect
10. construction avec « que » - Je crois que/ Je pense que/ Je sais que

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1

GERMAN – I

Course Code	L	T	P	Credit
FLG111	2	-	-	2

Course Learning Outcomes:

1. understand and give instructions.
2. understand and reply to a letter.
3. speak about learning languages.
4. find a particular information in a text.
5. understand a conversation.

Course Contents:

Module I: Modal verbs

Modal verbs with conjugations and usage

Imparting the finer nuances of the language

Module II: Information about Germany (ongoing)

Information about Germany in the form of presentations or "Referat"– neighbors, states and capitals, important cities and towns and characteristic features of the same, and also a few other topics related to Germany.

Module III: Dative case

Dative case, comparison with accusative case

Dative case with the relevant articles

Introduction to 3 different kinds of sentences – nominative, accusative and dative

Module IV: Dative personal pronouns

Nominative, accusative and dative pronouns in comparison

Module V: Dative prepositions

Dative preposition with their usage both theoretical and figurative use

Module VI: Dialogues

In the Restaurant,
At the Tourist Information Office,
A telephone conversation

Module VII: Directions

Names of the directions
Asking and telling the directions with the help of a roadmap

Module VIII: Conjunctions

To assimilate the knowledge of the conjunctions learnt indirectly so far

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2

- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH – I

Course Code	L	T	P	Credit	Semester
FLS111	2	-	-	2	I

Course Learning Outcomes:

1. Identify and express in Spanish vocabulary and grammar norms
2. Interpret different types of texts as well as cultural ideas and themes.
3. Demonstrate comprehension of nuance between script and sound in Spanish.
4. Narrate clearly ideas, themes in simple standard Spanish.

Course Contents:

Module I

Revision of earlier semester modules

Set expressions (idiomatic expressions) with the verb *Tener*, *Poner, Ir….*

Weather

Module II

Introduction to *Gustar*…and all its forms. Revision of *Gustar* and usage of it

Module III

Translation of Spanish-English; English-Spanish. Practice sentences.

How to ask for directions (using estar)

Introduction to IR + A + INFINITIVE FORM OF A VERB

Module IV

Simple conversation with help of texts and vocabulary

En el restaurante

En el instituto

En el aeropuerto

Module V

Reflexives

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras -Nivel Elemental

CHINESE – I

Course Code	L	T	P	Credit	Semester
FLC111	2	-	-	2	I

Course Learning Outcomes:

1. Read, write and speak approx. 100New Chinesewords and understand basic grammar points.
2. Interpretwords, phrases and sentences of Greetings, personal information like self-introduction, family, Hobbies, abilities Expression of gratitude apology etc .
3. Write Chinesecharacters, simple sentence and a paragraph on Greetings, personal information like self-introduction, family, Hobbies, abilities Expression of gratitude apology etc

Course Contents:

Module I

Drills
Dialogue practice
Observe picture and answer the question.
Introduction of written characters.
Practice reading aloud
Practice using the language both by speaking and by taking notes.
Character writing and stroke order

Module II

Measure words
Position words e.g. inside, outside, middle, in front, behind, top, bottom, side, left, right, straight.
Directional words – beibian, xibian, nanbian, dongbian, zhongjian.
Our school and its different building locations.
What game do you like?
Difference between “hii” and “neng”, “keyi”.

Module III

Changing affirmative sentences to negative ones and vice versa
Human body parts.
Not feeling well words e.g.; fever, cold, stomach ache, head ache.
Use of the modal particle “le”
Making a telephone call
Use of “jiu” and “cal” (Grammar portion)
Automobiles e.g. Bus, train, boat, car, bike etc.
Traveling, by train, by airplane, by bus, on the bike, by boat.. etc.

Module IV

The ordinal number “di”
“Mei” the demonstrative pronoun e.g. mei tian, mei nian etc.
use of to enter to exit

Structural particle “de” (Compliment of degree).
Going to the Park.
Description about class schedule during a week in school.
Grammar use of “li” and “cong”.
Comprehension reading followed by questions.

Module V
Persuasion-Please don’t smoke.
Please speak slowly
Praise – This pictorial is very beautiful
Opposites e.g. Clean-Dirty, Little-More, Old-New, Young-Old, Easy-Difficult, Boy-Girl, Black-White, Big-Small, Slow-Fast … etc.
Talking about studies and classmates
Use of “it doesn’t matter”
Enquiring about a student, description about study method.
Grammar: Negation of a sentence with a verbal predicate.

Examination Scheme:

Components	**CT1**	**CT2**	**C**	**I**	**V**	**A**
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- “Elementary Chinese Reader Part I, Part-2” Lesson 21-30

SOFTWARE ENGINEERING & PROJECT MANAGEMENT

Course Code	L	T	P	Credit	Semester
MCA 201	2	1	-	3	II

Course Learning Outcomes:

(1) To define basic concepts of software development such as requirement analysis, designing, testing and debugging etc.

(2) To explain different types of models that can be used to design a software.

(3) To design solutions to a given problem and analyze the best one on the basis of parameters like cost, time, knowledge.

(4) To apply the various testing techniques and testing tools.

(5) To explain the importance of reliability in software development

Module I: Introduction to Software Engineering and Project Management

Introduction to Software Engineering: Software, Evolving role of software, Three "R"-Reuse, Reengineering and Retooling, An Overview of IT Project Management: Define project, project management framework, the role of project Manager, Systems View of Project Management, Stakeholder management, Project phases and the project life cycle.

Module II: Software Development Life Cycle Models

Overview of Software Development Life Cycle, Process Models: Waterfall Model, Evolutionary Process Model: Prototype and Spiral Model, Incremental Process model: Iterative approach, RAD, JAD model, Concurrent Development Model, Agile Development: Extreme programming, Scrum.

Module III: Software Requirement Analysis and Specification

Types of Requirement, Feasibility Study, Requirement Analysis and Design: DFD, Data Dictionary, Requirement Elicitation: Interviews, Questionnaire, Brainstorming, Facilitated Application Specification Technique (FAST), Use Case Approach. SRS Case study, Software Estimation: Size Estimation: Function Point (Numerical). Cost Estimation: COCOMO (Numerical), COCOMO-II (Numerical), Earned Value Management.

Module IV: Software Project Planning

Business Case, Project selection and Approval, Project charter, Project Scope management: Scope definition and Project Scope management, Creating the Work Breakdown Structures, Scope Verification, Scope Control.

Module V: Project Scheduling and Human Resource management

Relationship between people and Effort: Staffing Level Estimation, Effect of schedule Change on Cost, Degree of Rigor & Task set selector, Project Schedule, Schedule Control, CPM (Numerical), Human Resource Planning, Acquiring the Project Team, Resource Assignment, Loading, Leveling, Developing the Project Team: Team Structures, Managing the Project Team.

Module VI: Software Quality and Risk Management

Software quality, software reliability models, Overview of ISO 9001, SEI Capability Maturity Model, McCalls Quality Model, Six Sigma, Formal Technical Reviews, Tools and Techniques for Quality Control, Quality Control Charts, Modern Quality Management, Risk Management: Identify IT Project Risk, Risk Analysis and Assessment, Risk Strategies, Risk Monitoring and Control, Risk Response and Evaluation.

Module VII: Software Maintenance

Maintenance Process, Maintenance Model, Estimation of maintenance cost, Regression Testing, Reverse Engineering, Software Re-engineering, Configuration Management and Documentation.

Examination Scheme:

Components	**C T**	**Assignement**	**P/V**	**Quiz**	**Attd**	**EE**
Weightage (%)	15	10	10	10	5	50

CT: Class Test, HA: Home Assignment, V/Q: Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

Text

- *Software Engineering, 5th and 7th edititon, by Roger S Pressman, McGraw Hill publication*
- *Software Engineering Project Management by Richard H. Thayer Wiley India Publication.*

References:

- https://www.rgpvnotes.in/2018/01/cs-6003-software-engineering-project.html (Online Tutorial)

ADVANCED JAVA

Course Code	L	T	P	Credit	Semester
MCA 202	2	1	-	3	II

Course Learning Outcomes:

1. Develop Swing-based GUI
2. Develop client/server applications and TCP/IP socket programming
3. Update and retrieve the data from the databases using SQL
4. Develop distributed applications using RMI
5. Develop component-based Java software using JavaBeans
6. Develop server side programs in the form of servlets

Course Contents:

Module I
Introduction of Swing, Swing Components, Look and Feel for Swing Components, Introduction to Multimedia Programming

Module II
Introduction to Servlets, Servlet Life Cycle, Servlet based Applications, Servlet and HTML. JSP: Introduction to JSP, JSP implicit objects, JSP based Applications

Module III
ODBC and JDBC Drivers, Connecting to Database with the java.sql Package, Using JDBC Terminology; Evolving Nature of Area

Module IV
Enterprise Java Beans:-EJB roles—EJB Client-Object -container-Transaction Management—implementing a Basic EJB Object-Implementing session Beans-Implementing Entity Beans-Deploying an enterprise Java Beans Object-Changes in EJB1.1 specification.

Module V
The J2EE Platform, The J2EE connector Architecture, J2EE Packaging and Deployment Overview of Other Java Technologies : Java Message Service (JMS), Java in small memory space (PDA), Distributed Computing (J2EE, CORBA, DCOM)

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

CT: Class Test, HA: Home Assignment, V/Q: Viva/Quiz, EE: End Semester Examination; Att: Attendance

Text & References:

Text:

- Java 2 Unleashed (Techmedia – SAMS) By Jamie Jaworski
- Professional Java Server Programming (a Press) By Allamaraju
- Developing Java Servlets (Techmedia – SAMS) By James Goodwill
- Using Java 1.2 Special Edition (PHI) By Webber

References:

- David Flanagan, Jim Parley, William Crawford & Kris Magnusson , Java Enterprise in a nutshell- A desktop Quick reference -O'REILLY, 2003
- Stephen Ausbury and Scott R. Weiner, Developing Java Enterprise Applications, Wiley-2001
- Jaison Hunder & William Crawford, Java Servlet Programming, O'REILLY, 2002
- Dietal and Deital, "JAVA 2" PEARSON publication

DISTRIBUTED OPERATING SYSTEM

Course Code	L	T	P	Credit	Semester
MCA 203	2	1	-	3	II

Course Learning Outcomes:

CO1: To get knowledge in distributed architecture, naming, synchronization, consistency and replication, fault tolerance, security, and distributed file systems.
CO2: To analyze the current popular distributed systems such as peer-to-peer (P2P) systems will also be analyzed.
CO3: To know about Shared Memory Techniques.

Course Contents:

Module I

Modes of communication, System Process, Interrupt Handling, Handling Systems calls, Protection of resources &Resources Management Micro-Kernel Operating System. Distributed Operating System, Issue in the design of Distributed Operating System, Overview of Computer Networks. Inter process communication, Remote Procedure calls, RPC exception handling.

Module II: Clock Synchronization

Logical clocks, Physical clocks, clock synchronization algorithms, Mutual Exclusion, Election Algorithms, Dead locks in Distributed Systems. Thrashing, Heterogeneous DSM, Resource Management (Load Balancing approach, Load Sharing approach), Process Management: process Migration, Thread.

Module III

Overview of shared memory, consistency model, Page based Distributed Shared Memory, Shared –variable Distributed Memory, Object -based Distributed Memory.

Module IV

File models, File access, File sharing, file-caching, File Replication, fault Tolerance, Network File System, (case study, Security in Distributed File system.

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Distributed Operating Systems 1st Edition by Andrew S. Tanenbaum
- Distributed Systems: Principles and Paradigms (2nd Edition) 2nd Edition, by Andrew S. Tanenbaum, Maarten Van Steen

SOFTWARE ENGINEERING AND PROJECT MANAGEMENT LAB

Course Code	L	T	P	Credit	Semester
MCA221	-	-	2	1	II

Course Learning Outcomes:

(1) To define basic concepts of software development such as requirement analysis, designing, testing and debugging etc.

(2) To explain different types of models that can be used to design a software.

(3) To design solutions to a given problem and analyze the best one on the basis of parameters like cost, time, knowledge.

(4) To apply the various testing techniques and testing tools.

(5) To explain the importance of reliability in software development

Course Contents:

Lab Exercises:

1. Phases in software development project, overview, need, stakeholders of project.
2. Develop requirements specification for a given problem
3. To perform the system analysis : Requirement analysis, SRS
4. To perform the function oriented diagram: DFD and Structured chart.
5. Develop UML Use case model for a problem.
6. Develop PERT chart for scheduling of project
7. Develop Gantt chart for resource allocation of project
8. To draw the behavioral view diagram : State-chart diagram, Activity diagram
9. To draw the implementation view diagram: Component diagram
10. To draw the environmental view diagram : Deployment diagram
11. To perform various testing using the testing tool unit testing, integration testing
12. Using one project management tool -Libra

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ADVANCED JAVA LAB

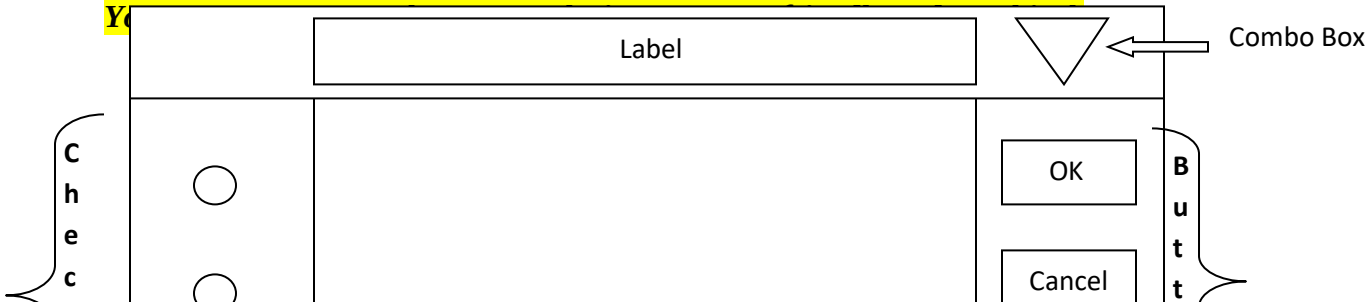
Course Code	L	T	P	Credit	Semester
MCA 222	-	-	2	1	II

Course Learning Outcomes:

1. Develop Swing-based GUI
2. Develop client/server applications and TCP/IP socket programming
3. Update and retrieve the data from the databases using SQL
4. Develop distributed applications using RMI
5. Develop component-based Java software using Java Beans
6. Develop server side programs in the form of servlets

1. WAP to create frame window from within an applet using AWT.
2. WAP to use all the mouse events (click, entered, exit, pressed, released, dragged, and move) in both child and applet windows using AWT. The event will display the windows X axis and Y axis coordinates.
3. WAP to demonstrate the color (user defined) using applet.
4. WAP to display the available fonts using AWT.
5. WAP to create a calculator using AWT with following criteria.
    a. Label: Calculator name
    b. Combo Box: Operation to be performed (Addition, Subtraction, Multiplication and Division).
    c. Left Side Check Box: Used to include style.
    d. Buttom Side Check Box: Used to include color.
    e. Right Side Button: Specific Task.
    f. Central part: Include button for numerical values and display results.

Y



6. Write a java program to handle an event in a Swing.
7. Write a java program to show simple swing based applet.
8. Perform the question number 5 with the help of swings. At the same time use their components.
9. WAP that implement a simple servlet program.
10. Write a servlet program that reads servlet parameters.
11. Write a servlet program to handle HTTP request and response.
12. Write a servlet program to show the session tracking.
13. Write a JSP program to show the use of their expression, scriptlets and declaration.
14. Write a JSP program to show the use of predefined java class.
15. Write a JSP program to show the use of built in objects.
16. Write a JSP program to include other files with JSP.
17. Write a JSP program to show the utility of Textbox, Button, Radio Button, and Checkbox.
18. WAP for authentication, which validate the First_Name and Second_Name by the JSP.
19. WAP to read data send by a client (HTML page) using JSP.
20. Write a JSP program to show the utility of cookies.
21. Create a Sign Up/Sign In page in java with database connectivity using oracle 10g. Include necessary functionality to demonstrate their work.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**

5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

CLOUD COMPUTING

Course Code	L	T	P	Credit	Semester
MCA 231	2	1	-	3	II

Course Learning Outcomes:

1) Explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.

2) Apply fundamental concepts in cloud infrastructures to understand the tradeoffs in power, efficiency and cost, and then study how to leverage and manage single and multiple datacenters to build and deploy cloud applications that are resilient, elastic and cost-efficient.

3) Discuss system, network and storage virtualization and outline their role in enabling the cloud computing system model.

4) Illustrate the fundamental concepts of cloud storage and demonstrate their use in storage systems such as Amazon S3 and HDFS.

5) Analyze various cloud programming models and apply them to solve problems on the cloud

Course Contents

MODULE I: CLOUD ARCHITECTURE AND MODEL

Technologies for Network-Based System – System Models for Distributed and Cloud Computing – NIST Cloud Computing Reference Architecture. Cloud Models:- Characteristics – Cloud Services – Cloud models (IaaS, PaaS, SaaS) – Public vs Private Cloud –Cloud Solutions - Cloud ecosystem – Service management – Computing on demand.

MODULE II: VIRTUALIZATION

Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization - Virtualization Structures - Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices - Virtual Clusters and Resource management – Virtualization for Data-center Automation.

MODULE III: CLOUD INFRASTRUCTURE

Architectural Design of Compute and Storage Clouds – Layered Cloud Architecture Development – Design Challenges - Inter Cloud Resource Management – Resource Provisioning and Platform Deployment – Global Exchange of Cloud Resources.

MODULE IV: PROGRAMMING MODEL

Parallel and Distributed Programming Paradigms – MapReduce , Twister and Iterative MapReduce – Hadoop Library from Apache – Mapping Applications - Programming Support - Google App Engine, Amazon AWS - Cloud Software Environments -Eucalyptus, Open Nebula, OpenStack, Aneka, CloudSim

MODULE V: SECURITY IN THE CLOUD

Security Overview – Cloud Security Challenges and Risks – Software-as-a-Service Security – Security Governance – Risk Management – Security Monitoring – Security Architecture Design – Data Security – Application Security – Virtual Machine Security - Identity Management and Access Control – Autonomic Security.

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- John W.Rittinghouse and James F.Ransome, "Cloud Computing: Implementation, Management, and Security", CRC Press, 2010.
- Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach", TMH, 2009.
- Kumar Saurabh, "Cloud Computing – insights into New-Era Infrastructure", Wiley India,2011.
- James E. Smith, Ravi Nair, "Virtual Machines: Versatile Platforms for Systems and Processes", Elsevier/Morgan Kaufmann, 2005.
- Ronald L. Krutz, Russell Dean Vines, "Cloud Security – A comprehensive Guide to Secure Cloud Computing", Wiley – India, 2010.

SOFT COMPUTING

Course Code	L	T	P	Credit	Semester
MCA 232	2	1	-	3	II

Course Learning Outcomes:

1. Understand of the basic areas of Soft Computing including Artificial Neural Networks, Fuzzy Logic and Genetic Algorithms.
2. Provide the mathematical background for carrying out the optimization associated with neural network learning.
3. Relate with neural networks that can learn from available examples and generalize to form appropriate rules for inference systems.
4. Describe with genetic algorithms and other random search procedures useful while seeking global optimum in self-learning situations.
5. Develop some familiarity with current research problems and research methods in Soft Computing Techniques.

Course Contents:

Introduction to Soft Computing

Introduction, Fuzzy Computing, Neural Computing, Genetic Algorithms, Associative Memory, Adaptive Resonance Theory, Applications

Fundamentals of Neural Network

Introduction, Model of Artificial Neuron, Architectures, Learning Methods, Taxonomy of NN Systems, Single-Layer NN System, Applications.

Back Propagation Network

Background, Back-Propagation Learning, Back-Propagation Algorithm.

Associative Memory

Description, Auto-associative Memory, Bi-directional Heteroassociative

Fundamentals of Genetic Algorithms

Introduction, Encoding, Operators of Genetic Algorithm, Basic Genetic Algorithm.

Swarm Intelligent System

Introduction to swarm intelligence, Background, ACO, ABC, Cuckoo search algorithms.

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis & Applications, S. Rajasekaran, G. A. Vijayalakshami, PHI.

- Chin Teng Lin, C. S. George Lee, Neuro-Fuzzy Systems, PHI

- Tomthy Ross,Fuzzy Logic and Engineering Application, TMH
- Kishan Mehrotra,Elements of Artificial Neural Network, MIT Press
- E. Goldberg,Genetic Algorithms: Search and Optimization, Addision-Wesley
- Recent Articles and Research papers

HIGH PERFORMANCE COMPUTING

Course Code	L	T	P	Credit	Semester
MCA 233	2	1	-	3	II

Course Learning Outcomes:

1. Students will be acquainted with the fundamental programming techniques for high performance computer architectures.
2. Students will be able to design, implement and benchmark parallel programs on shared-memory and distributed-memory systems.
3. To apply these concepts to examine complex biomolecular/materials systems that generally require large-scale .

Course Contents:

Module I Program execution

Program, Compilation, Object files, Function call and return, Address space, Data and its representation.

Module II Computer organization

Memory, Registers, Instruction set architecture, Instruction processing.

Module III Pipelined processors

Pipelining, Structural, data and control hazards, Impact on programming. Virtual memory: Use of memory by programs, Address translation, Paging. Cache memory: Organization, impact on programming, virtual caches.

Module IV Operating systems

Processes and system calls, Process management Program profiling. File systems: Disk management, Name management, Protection. Parallel architecture: Inter-process communication, Synchronization, Mutual exclusion, Basics of parallel architecture, Parallel programming with message passing using MPI.

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text:

- J. L. Hennessy and D. A. Patterson, Computer Architecture: A Quantitative Approach, Morgan Kaufmann.

References:

- A. Silberschatz, P. B. Galvin, G. Gagne, Operating System Concepts, John Wiley.
- R. E. Bryant and D. R. O'Hallaron, Computer Systems: A Programmer's Perspective, Prentice Hall.

Web References:

- ***http://nptel.ac.in/syllabus/106108055/***

EMBEDDED SYSTEMS

Course Code	L	T	P	Credit	Semester
MCA 234	2	1	-	3	II

Course Learning Outcomes:

1. To have knowledge about the basic working of a microcontroller system and its programming in assembly language.
2. To provide experience to integrate hardware and software for microcontroller applications systems.
3. Program ARM microcontroller to perform various tasks.
4. Understand the key concepts of embedded systems such as I/O, timers, interrupts and interaction with peripheral devices.

Module 1: INTRODUCTION

Introduction: Evolution of Computers, Technological Trends, Measuring performance Speed up, Computer organization: von Neumann Machine Architecture, Functional units and components, Program development tools. Instruction pipelining and parallel processing: Instruction pipeline, hazards, Data forwarding paths, RISC vs. CISC processors.

Module2: INTRODUCTION of EMBEDDED SYSTEM

Introduction of embeddes system, Processor: Embedded Processors in a System, Microprocessor,Microcontroller, Single Purpose Processors and Application specific system processors (ASSPs) inembedded systems. Embedded hardware units and devices

Module 3: INTERRUPTS HANDLER, EMBEDDED SOFTWARE

Interrupts handler, Embedded software, Final Machine Implement-able Software for a System, Coding of Software in Machine Codes, software in Processor Specific Assembly Language, Software in High Level Language, Program Models for Software Designing, Software for Concurrent Processing and Scheduling of Multiple Tasks and ISRs Using an RTOS, Software for the Device Drivers and Device Management using an Operating System, Software tools in designing of an Embedded System, Needed Software Tools in the Exemplary cases. Examples of Embedded System

Module 4: The Embedded Computing Platform

Embedded Computing Platform ,CPU Bus, Memory Devices, I/O Devices, Component Interfacing

Module 5: Real-Time Operating Systems

Inter Process Communication & Synchronization of Processes, task and threads, multiple processes in an application, multiple threads in an application, task and states, task and data clear cut distinction between functions, ISRs and Tasks by their Characteristics.

Module 6: CONCEPT OF SEMAPHORES

Concept of semaphores,Use of a Single Semaphore as an event signaling variable or notifying variable (event flag), Use of a Single Semaphore as resource key and in critical Section, Mutex, Use of Multiple Semaphores, Use of Mutex, Counting Semaphores, P and V semaphores shared data: Problem of Sharing Data by Multiple Tasks and Routines, Shared Data,Deadlock Situations ,inter process Communication semaphores, Message Queues, Mailboxes, Pipes, Sockets, Remote Procedure Calls (RPCs).

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

ACCESSING THE WAN

Course Code	L	T	P	Credit	Semester
MCA 235	2	1	-	3	II

Course Learning Outcomes:

1. Students learn about user access technologies and devices and discover how to implement and configure Point-to-Point Protocol (PPP), Poin-to-Point Protocol over Ethernet (PPPoE), DSL, and Frame Relay.
2. WAN security concepts, tunneling, and VPN basics are introduced.
3. Administer a network infrastructure.
4. Troubleshoot problems in an existing network environment.
5. Evaluate and implement new and future technologies into current system.

Course Contents:

Module I: Introduction to WAN

Providing Integrated Services to Enterprise, WAN Technology Concept, WAN Connection Option

Module II: PPP

Serial Point to Point Links, PPP Concept, Configuring PPP, Configuring PPP with Authentication.

Module III: Frame Relay

Basic Frame Relay Concepts, Configuring Frame Relay, Advanced Frame Relay Concept, Configuring Advanced Frame Relay Concept

Module IV: Network Security

Introduction to Network Security, Securing Cisco Routers, Secure Router Network Services, Using Cisco SDM, Secure Router Management

Module V: ACLs

Using ACL to Secure Network, Configuring Standard ACLs, Configuring Extended ACLs, Configuring Complex ACLs

Module VI: Teleworker Services

Business Requirement for Teleworker Services, Broadband Services, VPN Technology

Module VII: IP addressing Services

DHCP, Scaling Network with NAT, Ipv6

Module VIII: Network Troubleshooting

Establishing Network Performance Base Line, Troubleshooting Methodology and Tools, Common WAN Implementation Issues, Network Troubleshooting

Examination Scheme:

Components	**C T**	**Assignement**	**P/V**	**Quiz**	**Attd**	**EE**
Weightage (%)	15	10	10	10	5	50

Text & References:

Text

- Cisco Networking Academy Programme CCNA 4 Companion Guide, 3rd Edn by Pearson Education.
- Cisco Networking Academy Programme CCNA 4 Lab Companion, 3rd Edn by Pearson Education.
- CISCO CCNA-Exploration 4.0, Module 4, Pearson Education.

References:

- Cisco Networking Academy Programme CCNA 4 Engineering General, 3rd Edn by Pearson Education

Note: This is an online course of Cisco. Online materials provided by Cisco are studied.

ASP.NET USING C#

Course Code	L	T	P	Credit	Semester
MCA 236	2	1	-	3	II

Course Learning Outcomes:

1. This course is designed to provide the knowledge of Dot Net Frameworks along with ASP.Net and C#
2. After completion of the course the student will be able to use the features of Dot Net
3. Framework along with the features of ASP. NET & C# and understand the Microsoft .NET Framework and
4. ASP.NET page structure and design web application with variety of controls
5.Use Microsoft ADO.NET to access data in web Application and access the data using inbuilt data access tools.

Course Contents:

Module I: Introduction to .NET technologies

Features of .NET, .NET Framework, CLR, MSIL, .NET class library, .NET Languages, CTS, assemblies, manifest, and metadata, What is ASP.NET?, Difference between ASP and ASP.NET.

Module II: Controls in ASP.NET

Overview of Dynamic Web page, Understanding ASP.NET Controls, Applications, Web servers, Installation of IIS.Web forms, web form controls -server controls, client controls. Adding controls to a web form, Buttons, Text Box, Labels, Checkbox, Radio Buttons, List Box. Adding controls at runtime. Running a web Application, creating a multiform web project. Form Validation: Client side validation, server Side validation, validation Controls: Required Field Comparison Range. Calendarcontrol, Ad rotator Control, Internet Explorer Control.

Module III: Overview of ADO.NET and XML

What is ADO.NET, from ADO to ADO.NET. ADO.NET architecture, Accessing Data using Data Adapters and Datasets , using Command & Data Reader, binding data to data bind Controls, displaying data in data grid, XML basics, attributes, fundamental XML classes: Document, text writer, text reader. XML validations, XML in ADO.NET, The XML Data Document.

Module IV: ASP.NET Applications

Creating, tracking, caching, error handling, Securing ASP.NET applications- form based applications, window based application.

Module V: Web services

Introduction, State management- View state, Session state, Application state, Building ASP.NET web services, working with ASP.NET applications, creating custom controls.

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE

Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- ASP.NET Unleashed by Stephen Walther, SAMS publications

References:

- ASP.NET, Wrox Publications
- ASP.NET and VB.NET, Wrox Publication
- ASP.NET and C#.NET, Wrox publication.

PHP

Course Code	L	T	P	Credit	Semester
MCA 237	**2**	**1**	**-**	**3**	**II**

Course Learning Outcomes:

1. To compare between Static and Dynamic content.

2. To implement the concept of File handling.

3. To illustrate the framework of PHP an open source technologies.

4. To develop a Website with database programming in PHP.

Course Contents:

Module I: Introduction to PHP Servers : Introducing Apache, PHP, MySql, Installing XAMPP, PHP, MySql, Configuring Apache for PHP, Introduction to PHP, Syntax, Common PHP Script Elements, Variables, String, Operators, If...Else, Switch, Arrays, Looping, Functions, Forms, $_GET, $_POST, Date, Include, Error, Exception, Filter, PHP ODBC, Working With Forms, Processing Forms, Form Validation, Addressing the Stateless Nature of HTTP, Hidden Form Fields.

Module II: File Handling :File and Directory Handling, Including Files, File Access, Displaying directory files, Coping and renaming files, Deleting files, Opening and closing files, Reading files, Writing files, Logging visitor details, Enabling file uploads, Creating and upload form, Creating an upload script, Uploading a file

Module III: PHP and My SQL:Introducing databases Connect MySQL, Creating new database MySQL Create, Creating database table MySQL Insert, SQL data types, Inserting table data, Altering an existing table, Updating records, Deleting data, tables and databases, SQL Queries MySQL Select, MySQL Where, MySQL Order By, MySQL Update, MySQL Delete,, Creating Mysql user and password, Connecting a user to Mysql, Listing databases, Listing table names, Creating a database, Deleting a database, Creating a database table, Inserting table data, Altering tables, Retrieving data from a table

Module IV: Advance PHP : Declaring a class and Objects, The new keyword and constructor, Destructor, Access method and properties using $this variable, Public ,private, protected properties and methods, Static properties and method, Class constant, Introducing cookies, Set a cookie, Access limitation, Introducing sessions, Starting session, Session without cookies, Setting session persistence, Cookies or session, Sending plain text E-mail, Sending html E-mail, Creating an attachment form, Sending attachment with E-mail

Module – V: Content Management System

Introduction of Content Management System, Introduction about WordPress, WordPress.org vs. WordPress.com Introduction about drupal, Drupal installation, Maintenance mode, Working with plugins, Working with themes, Updation and deletion plugins, Upgrade the drupal versions, Forum Social media buttons, Slide show, Comments, Audio and video file in drupe, You tube in your drupal site

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

Atkinson, Leon. *Core PHP Programming, 2nd Edition*. New York: Prentice Hall

References:

- http://www.zend.com
- http://www.php.net
- http://www.mysql.com
- http://www.phpbuilder.com
- http://www.useit.com
- http://www.devshed.com
- http://www.webmonkey.com

ROUTING PROTOCOL AND CONCEPT

Course Code	L	T	P	Credit	Semester
MCA 238	2	1	-	3	II

Course Learning Outcomes:

1. Demonstrate understanding of the purpose, nature, and operations of a router.
2. Analyze the role of static and dynamic routing protocols and place these protocols in the context of modern network design.
3. Compare classfull and classless IP addressing for a given network.
4. Configure basic RIPv2, single area OSPF, and EIGRP operations in a small routed network.andlt;br type=andquot;_mozandquot; /andgt;
5. Demonstrate understanding of the features and operations of the Enhanced Interior Gateway Routing Protocol (EIGRP)

Course Contents:

Module I: Intro to Routing and Packet Forwarding

Introduction, Inside the Router, CLI Configuration and Addressing, Building the Routing Tables, Path Determination and Switching Functions.

Module II: Static Routing

Introduction, Routers and Network, Router Configuration Review, Exploring Directly Connected Networks, Static Routes with "Next Hop", Addresses, Static Routes with Exit Interface, Summary and Default Static Routes, Managing and Troubleshooting Static Routes

Module III: Introduction to Dynamic Routing Protocols

Introduction, Classifying Dynamic Routing Protocols, Metrics, Administrative Distance, Routing Protocols and Subneting Activities.

Module IV: Distance Vector Routing Protocols

Introduction to Distance Vector Routing Protocols, Network Discovery, Routing Table Maintenance, Routing Loops, Distance Vector Routing Protocols Today.

Module V: RIP Version - I

Introduction, RIP v1, Distance Vector, Classful Routing Protocols, Basic RIPv1 Configuration, Verification and Troubleshooting, Automatic Summarization, Default Route and RIP v1.

Module VI: VLSM and CIDR

Introduction, Classful and Classless Addressing, VLSM, CIDR, VLSM and Route Summarization Activity.

Module VII: RIP Version - II

Introduction, RIPv1 Limitations, Configuration RIPv2, VLSM & CIDR, Verifying & Troubleshooting RIPv2.

Module VIII: The Routing Table – A Close Look

Introduction, the Routing Table Structure, Routing Table Lookup Process, Routing Behaviour.

Module IX: EIGRP

Introduction to EIGRP, Basic EIGRP Configuration, EIGRP Metric Calculation, DUAL, More EIGRP Configuration.

Module X: Link State Routing Protocols

Introduction, Link State Routing, Implementing Link State Routing Protocols.

Module XI: OSPF

Introduction to OSPF, Basic OSPF Configuration, The OSPF metric, OSPF and Multi-access Networks, More OSPF Configuration.

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Cisco Networking Academy Programme CCNA 1 & 2 Companion Guide, 3rd Edn by Pearson Education
- Cisco Networking Academy Programme CCNA 1 & 2 Lab Companion, 3rd Edn by Pearson Education
- Cisco Networking Academy Programme CCNA 1 & 2 Engineering General, 3rd Edn by Pearson Education

References:

- Data Communications and Networking by Behrouz Forouzan, 3e, Tata McGraw-Hill
- Computer Networks by Andrews S. Tanenbaum, 4e, Pearson Education

STASTICAL ANALYSIS USING R

Course Code	L	T	P	Credit	Semester
MCA 239	2	1	-	3	II

Course Learning Outcomes:

1. Install, Code and Use R Programming Language in R Studio IDE to perform basic tasks on Vectors, Matrices and Data frames.
2. Describe key terminologies, concepts and techniques employed in Statistical Analysis.
3. Define, Calculate, Implement Probability and Probability Distributions to solve a wide variety of problems.
4. Conduct and Interpret a variety of Hypothesis Tests to aid Decision Making.
5. Understand, Analyse, Interpret Correlation and Regression to analyse the underlying relationships between different variables.

Course Contents:

Introduction

What Is Statistical Learning, Why Estimate f,How Do We Estimate f, The Trade-Off Between Prediction Accuracy and Model Interpretability , Supervised Versus Unsupervised Learning , Regression Versus Classification Problems ,Assessing Model Accuracy , Measuring the Quality of Fit ,The Bias-Variance Trade-Off ,The Classification Setting

Linear Regression

Simple Linear Regression , Estimating the Coefficients , Assessing the Accuracy of the Coefficient Estimates , Assessing the Accuracy of the Model , Multiple Linear Regression , Estimating the Regression Coefficients , Comparison of Linear Regression with K-Nearest Neighbors .

Classification

An Overview of Classification , Why Not Linear Regression, Logistic Regression , The Logistic Model , Estimating the Regression Coefficients , Making Predictions , Multiple Logistic Regression , Logistic Regression for >2 Response Classes , Linear Discriminant Analysis , Using Bayes' Theorem for Classification .

Resampling Methods

Cross-Validation , The Validation Set Approach , Leave-One-Out Cross-Validation ,k-Fold Cross-Validation , Bias-Variance Trade-Off for k-Fold Cross-Validation ,Cross-Validation on Classification Problems , The Bootstrap .

Linear Model Selection and Regularization

Subset Selection , Best Subset Selection , Stepwise Selection , Choosing the Optimal Model , Shrinkage Methods ,Ridge Regression ,The Lasso , Selecting the Tuning Parameter ,Dimension

Reduction Methods ,Principal Components Regression , Partial Least Squares ,Considerations in High Dimensions ,High-Dimensional Data ,What Goes Wrong in High Dimensions? Regression in High Dimensions , Interpreting Results in High Dimensions

Support Vector Machines

Maximal Margin Classifier ,What Is a Hyper plane? Classification Using a Separating Hyper plane , The Maximal Margin Classifier ,Construction of the Maximal Margin Classifier .The Non-separable Case , Support Vector Classifiers , Overview of the Support Vector Classifier , Details of the Support Vector Classifier , Support Vector Machines ,Classification with Non-linear Decision Boundaries , The Support Vector Machine , An Application to the Heart Disease Data.

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Suggested Reading

1. Introduction to Statistics and Data Analysis - With Exercises, Solutions and Applications in R By Christian Heumann, Michael Schomaker and Shalabh, Springer, 2016

2. The R Software-Fundamentals of Programming and Statistical Analysis -Pierre Lafaye de Micheaux, Rémy Drouilhet, Benoit Liquet, Springer 2013

3. A Beginner's Guide to R (Use R) By Alain F. Zuur, Elena N. Ieno, Erik H.W.G. Meesters, Springer 2009

ASP.NET USING C# LAB

Course Code	L	T	P	Credit	Semester
MCA 246	-	-	2	1	II

Course Learning Outcomes:

1.Create user interactive web pages using ASP.Net.
2.Create simple data binding applications using ADO.Net connectivity.
3. Performing Database operations for Windows Form and web applications.

Course Contents:

- Use of Controls in creating web pages
- Creating sessions
- Creating Custom controls
- Implementing security

List of Experiments

1. Program to display the addition, subtraction, multiplication and division of two number using console applications.
2. Program to display the first 10 natural numbers and their sum using console application.
3. Program to display the addition using the windows application.
4. Write a program to convert input string from lower to upper and upper to lower case.
5. Write a program to simple calculator using windows application.
6. Write a program working with Page using ASP.Net.
7. Write a program working with forms using ASP.NET.
8. Write a program to connectivity with Oracle database.
9. Write a program to access data source through ADO.NET.
10. Write a program to manage the session.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

PHP LAB

Course Code	L	T	P	Credit	Semester
MCA 247	-	-	2	1	II

Course Learning Outcomes:

1.To compare between Static and Dynamic content.

2. To implement the concept of File handling.

3. To illustrate the framework of PHP an open source technologies.

4. To develop a Website with database programming in PHP.

Course Contents:

1. Write the process of installation of web server.
2. Write programs to print all details of your php sever. Use phpinfo().
3. Write a program to give demo of ECHO and PRINT command.
4. Write a program sort ten number by using array.
5. Create a database in MySql and connect that database from PHP.
6. Write a program to Update, insert and delete the values of table

Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ROUTING PROTOCOLS AND CONCEPTS LAB

Course Code	L	T	P	Credit	Semester
MCA 248	-	-	2	1	II

Course Learning Outcomes:

1. Explain basic switching concepts and switch operation.
2. Describe switching technologies of VLANs, 802.1q, and Spanning Tree .
3. Describe the logical operations of VLANs in separating networks and how routing occurs between them.

Course Contents:

1.0 Cabling a Network and Basic Router Configuration

- Cable devices and establish console connections.
- Erase and reload the routers.
- Perform basic IOS command line interface operations.
- Perform basic router configuration.
- Verify and test configurations using show commands, ping and traceroute.
- Create a startup configuration file.
- Reload a startup configuration file.
- Install a terminal emulation program.

2.0 Basic Router Configuration

- Cable a network according to the Topology Diagram given by Lab Coordinator
- Erase the startup configuration and reload a router to the default state.
- Perform basic configuration tasks on a router.
- Configure and activate Ethernet interfaces.
- Test and verify configurations.
- Reflect upon and document the network implementation.

3.0 Challenge Router Configuration

- Subnet an address space given requirements.
- Assign appropriate addresses to interfaces and document.
- Cable a network according to the Topology Diagram.
- Erase the startup configuration and reload a router to the default state.
- Perform basic configuration tasks on a router.
- Configure and activate Serial and Ethernet interfaces.
- Test and verify configurations.
- Reflect upon and document the network implementation.

4.0 Basic Static Route Configuration

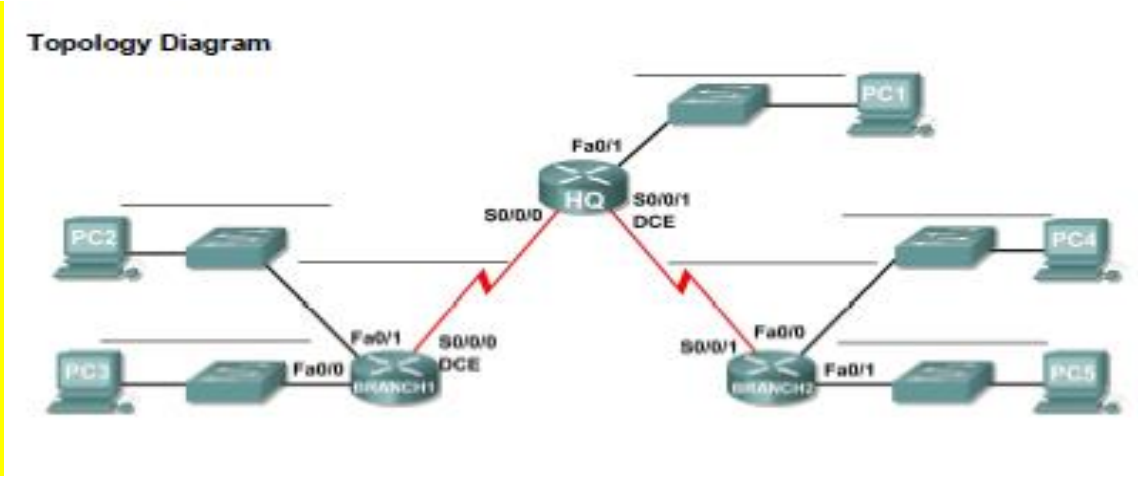
- Cable a network according to the Topology Diagram given by Lab Coordinator
- Erase the startup configuration and reload a router to the default state.
- Perform basic configuration tasks on a router.
- Interpret **debug ip routing** output.

- Configure and activate Serial and Ethernet interfaces.
- Test connectivity.
- Gather information to discover causes for lack of connectivity between devices.
- Configure a static route using an intermediate address.
- Configure a static route using an exit interface.
- Compare a static route with intermediate address to a static route with exit interface.
- Configure a default static route.
- Configure a summary static route.
- Document the network implementation.

5.0 Challenge Static Route Configuration

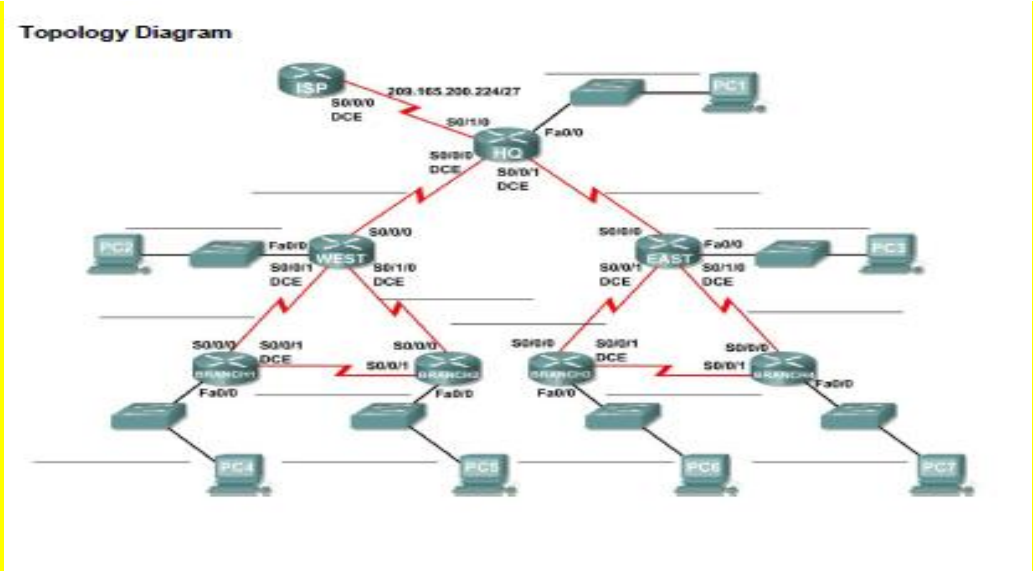
- Subnet an address space given requirements.
- Assign appropriate addresses to interfaces and document.
- Cable a network according to the Topology Diagram.
- Erase the startup configuration and reload a router to the default state.
- Perform basic configuration tasks on a router.
- Configure and activate Serial and Ethernet interfaces.
- Determine appropriate static, summary, and default routes.
- Test and verify configurations.
- Reflect upon and document the network implementation.

6.0 Subnetting Scenario 1



- Determine the number of subnets needed.
- Determine the number of hosts needed.
- Design an appropriate addressing scheme.
- Assign addresses and subnet mask pairs to device interfaces and hosts.
- Examine the use of the available network address space.
- Determine how static routing could be applied to the network.

7.0 Subnetting Scenario 2



Determine the number of subnets needed.
Determine the number of hosts needed.
Design an appropriate addressing scheme.
Assign addresses and subnet mask pairs to device interfaces and hosts.
Examine the use of the available network address space.
Determine how static routing could be applied to the network.

8.0 Routing Table Interpretation Lab
Given: The output from the HQ router
HQ#**show ip route**
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B – BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E – EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o – ODR
P - periodic downloaded static route
Gateway of last resort is not set
10.0.0.0/30 is subnetted, 1 subnets
C 10.10.10.252 is directly connected, Serial0/0/0
172.16.0.0/30 is subnetted, 1 subnets
C 172.16.100.0 is directly connected, Serial0/0/1
R 192.168.1.0/24 [120/1] via 10.10.10.254, 00:00:03, Serial0/0/0
R 192.168.2.0/24 [120/1] via 10.10.10.254, 00:00:03, Serial0/0/0
R 192.168.3.0/24 [120/1] via 10.10.10.254, 00:00:03, Serial0/0/0
C 192.168.4.0/24 is directly connected, Loopback0
C 192.168.5.0/24 is directly connected, Loopback1
C 192.168.6.0/24 is directly connected, Loopback2
R 192.168.7.0/24 [120/1] via 172.16.100.2, 00:00:04, Serial0/0/1
R 192.168.8.0/24 [120/1] via 172.16.100.2, 00:00:04, Serial0/0/1
R 192.168.9.0/24 [120/1] via 172.16.100.2, 00:00:04, Serial0/0/1

Given: The output from the BRANCH1 router

BRANCH1#**show ip route**

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B – BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E – EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o – ODR
P - periodic downloaded static route
Gateway of last resort is not set
10.0.0.0/30 is subnetted, 1 subnets
C 10.10.10.252 is directly connected, Serial0/0/0
R 172.16.0.0/16 [120/1] via 10.10.10.253, 00:00:04, Serial0/0/0
C 192.168.1.0/24 is directly connected, Loopback0
C 192.168.2.0/24 is directly connected, Loopback1
C 192.168.3.0/24 is directly connected, Loopback2
R 192.168.4.0/24 [120/1] via 10.10.10.253, 00:00:04, Serial0/0/0
R 192.168.5.0/24 [120/1] via 10.10.10.253, 00:00:04, Serial0/0/0
R 192.168.6.0/24 [120/1] via 10.10.10.253, 00:00:04, Serial0/0/0
R 192.168.7.0/24 [120/2] via 10.10.10.253, 00:00:04, Serial0/0/0
R 192.168.8.0/24 [120/2] via 10.10.10.253, 00:00:04, Serial0/0/0
R 192.168.9.0/24 [120/2] via 10.10.10.253, 00:00:04, Serial0/0/0

Given the output from the BRANCH2 router

BRANCH2#**show ip route**

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B – BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E – EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o – ODR
P - periodic downloaded static route
Gateway of last resort is not set
R 10.0.0.0/8 [120/1] via 172.16.100.1, 00:00:19, Serial0/0/1
172.16.0.0/30 is subnetted, 1 subnets
C 172.16.100.0 is directly connected, Serial0/0/1
R 192.168.1.0/24 [120/2] via 172.16.100.1, 00:00:19, Serial0/0/1
R 192.168.2.0/24 [120/2] via 172.16.100.1, 00:00:19, Serial0/0/1
R 192.168.3.0/24 [120/2] via 172.16.100.1, 00:00:19, Serial0/0/1
R 192.168.4.0/24 [120/1] via 172.16.100.1, 00:00:19, Serial0/0/1
R 192.168.5.0/24 [120/1] via 172.16.100.1, 00:00:19, Serial0/0/1
R 192.168.6.0/24 [120/1] via 172.16.100.1, 00:00:19, Serial0/0/1
C 192.168.7.0/24 is directly connected, Loopback0
C 192.168.8.0/24 is directly connected, Loopback1

C 192.168.9.0/24 is directly connected, Loopback2

Draw a diagram of the network based on your interpretation of the router outputs and do the following:

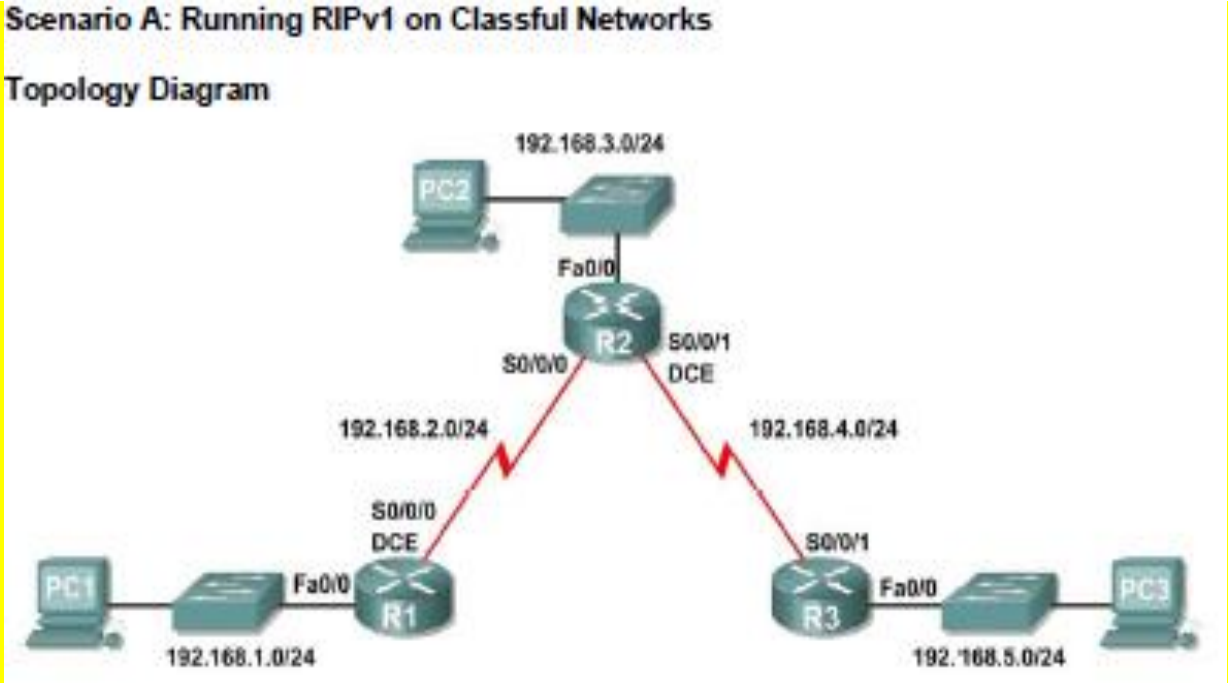
- Interpret router outputs.
- Identify the IP addresses for each router.
- Draw a diagram of the network topology.
- Cable and configure a network based on the topology diagram.
- Test and verify full connectivity.
- Reflect upon and document the network implementation.

9.0 Basic RIP Configuration

- Cable a network according to the Topology Diagram given below
- Erase the startup configuration and reload a router to the default state.
- Perform basic configuration tasks on a router.
- Configure and activate interfaces.
- Configure RIP routing on all routers.
- Verify RIP routing using **show** and **debug** commands.
- Reconfigure the network to make it contiguous.
- Observe automatic summarization at boundary router.
- Gather information about RIP processing using the **debug ip rip** command.
- Configure a static default route.
- Propagate default routes to RIP neighbors.
- Document the RIP configuration.

Scenarios

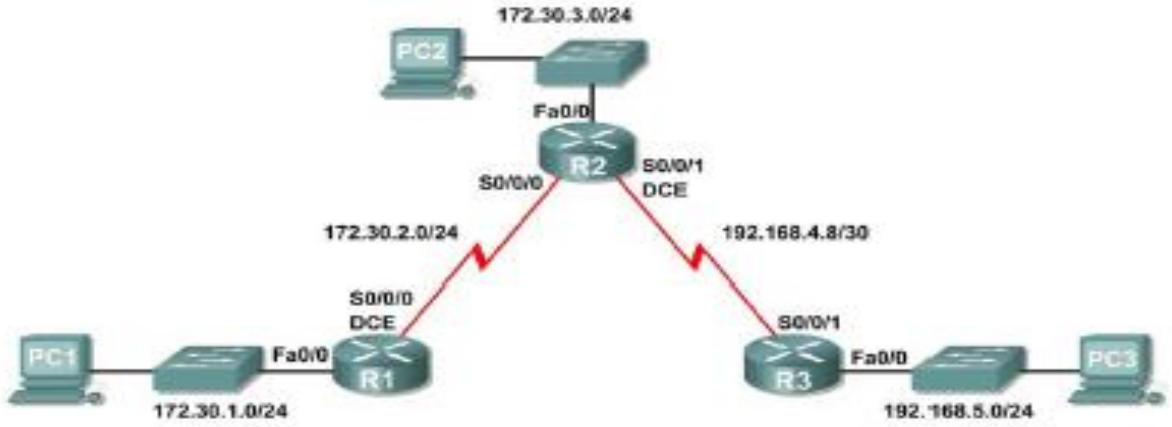
• Scenario A: Running RIPv1 on Classful Networks



• Scenario B: Running RIPv1 with Subnets and Between Classful Networks

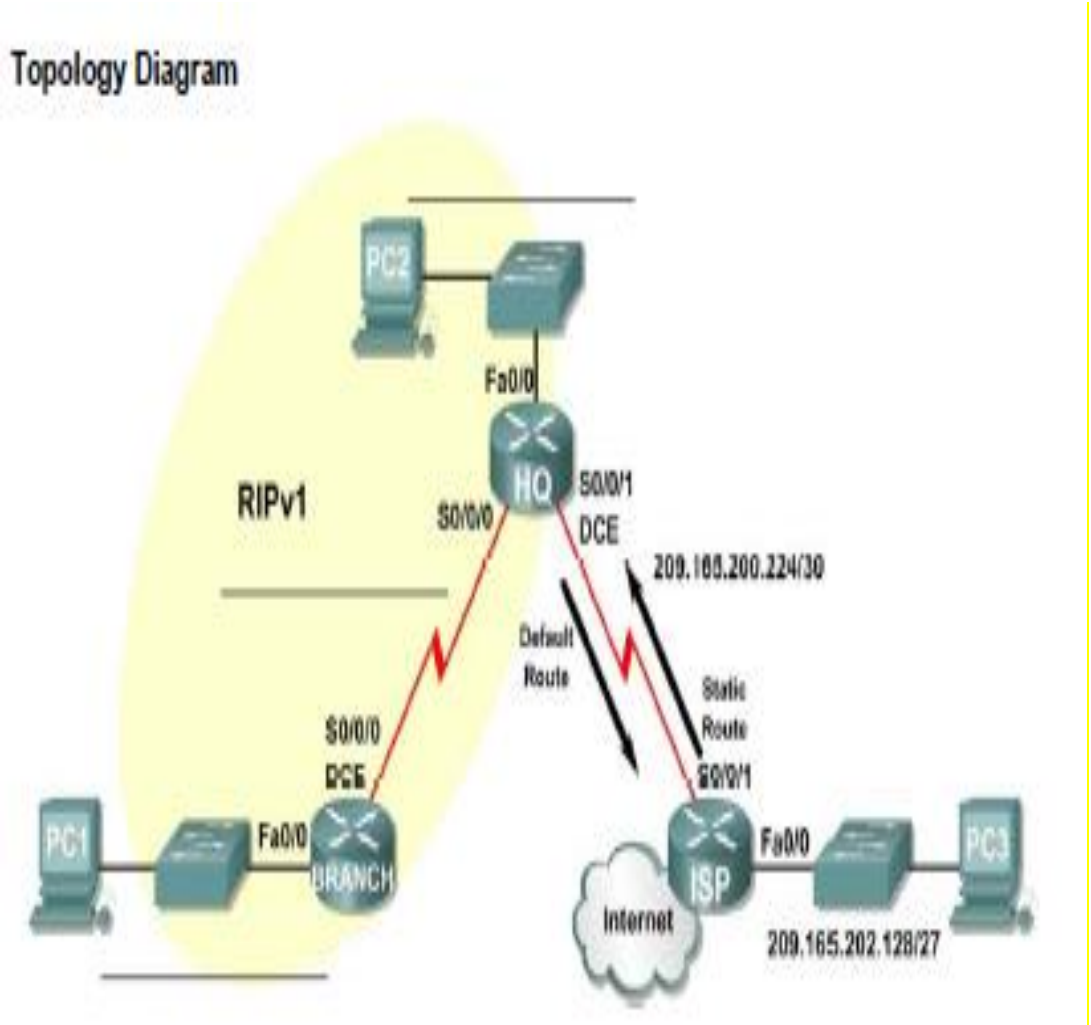
Scenario B: Running RIPv1 with Subnets and Between Classful Networks

Topology Diagram



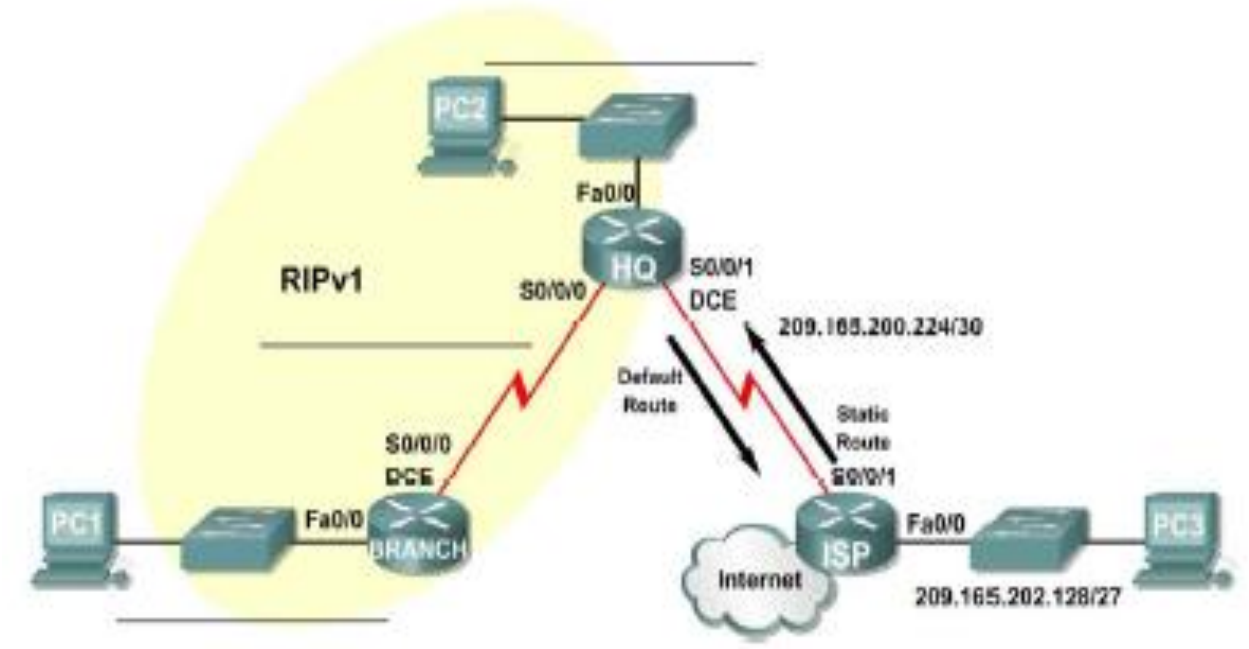
Scenario C: Running RIPv1 on a Stub Network

Topology Diagram



10.0 Challenge RIP Configuration

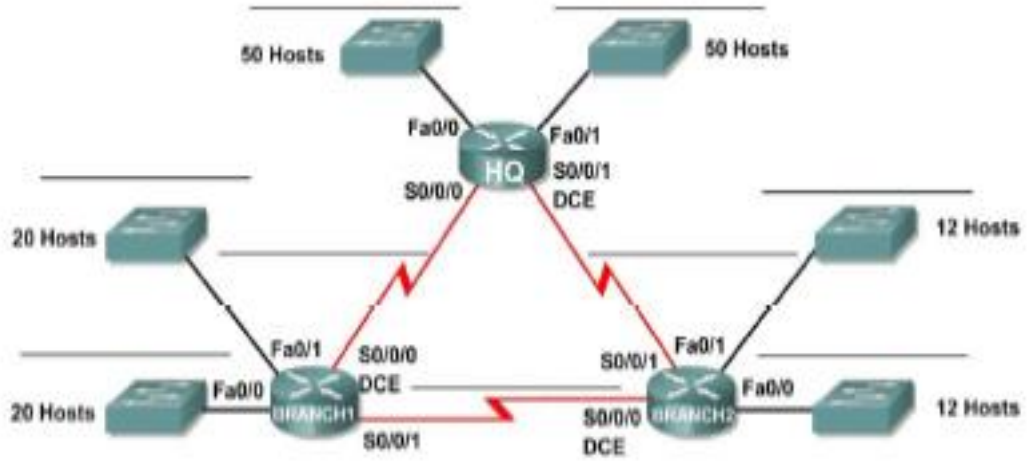
Topology Diagram



Subnet an address space given requirements.
• Assign appropriate addresses to interfaces and document them in the Addressing Table.
• Cable a network according to the Topology Diagram.
• Erase the startup configuration and reload a router to the default state.
• Configure RIPv1 routing on all routers.
• Configure and propagate a static default route.
• Verify RIPv1 operation.
• Test and verify full connectivity.
• Reflect upon and document the network implementation.

11.0 Basic VLSM Calculation and Addressing Design

Topology Diagram

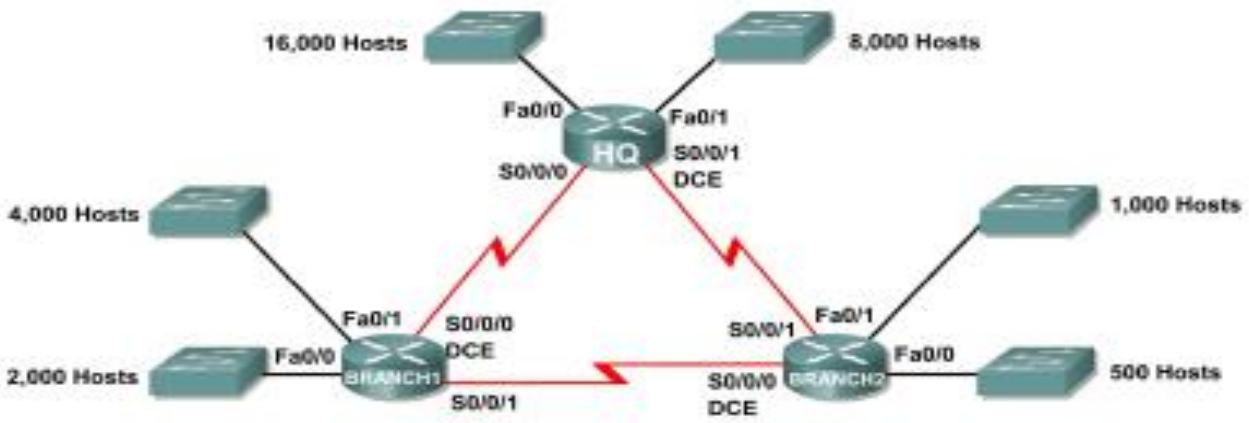


- Determine the number of subnets needed.
- Determine the number of hosts needed for each subnet
- Design an appropriate addressing scheme using VLSM.

- Assign addresses and subnet mask pairs to device interfaces.
- Examine the use of the available network address space.

12.0 Troubleshooting a VLSM Addressing Design

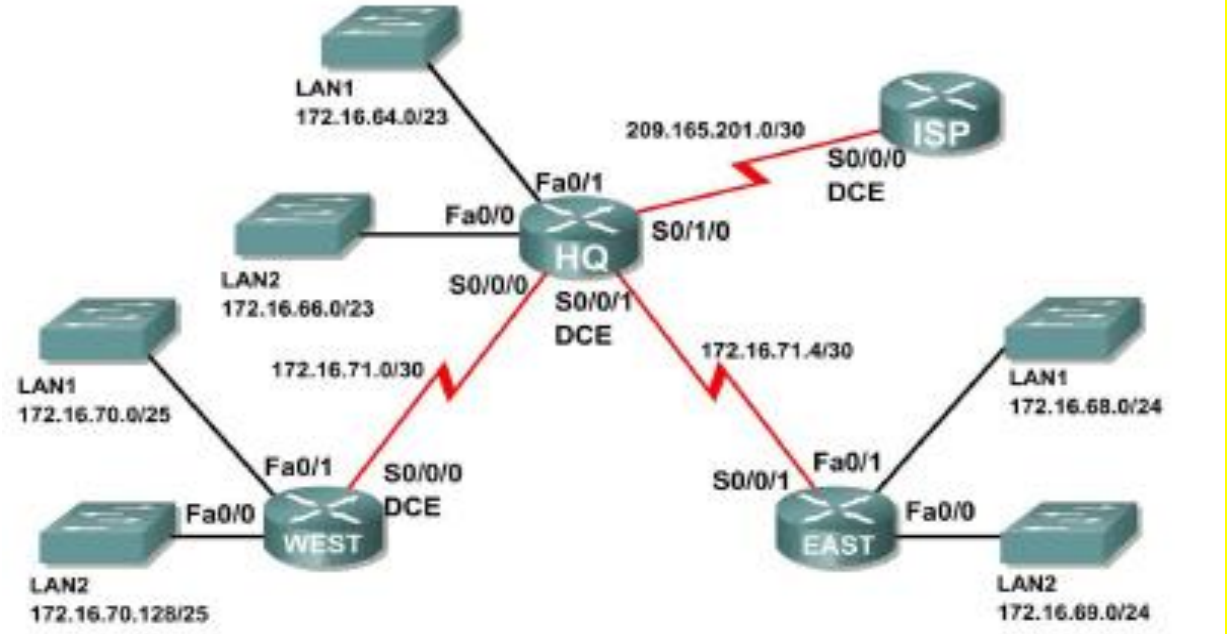
Topology Diagram



- Discover errors in a VLSM design.
- Propose solutions for VLSM design errors.
- Document the corrected VLSM assignments.

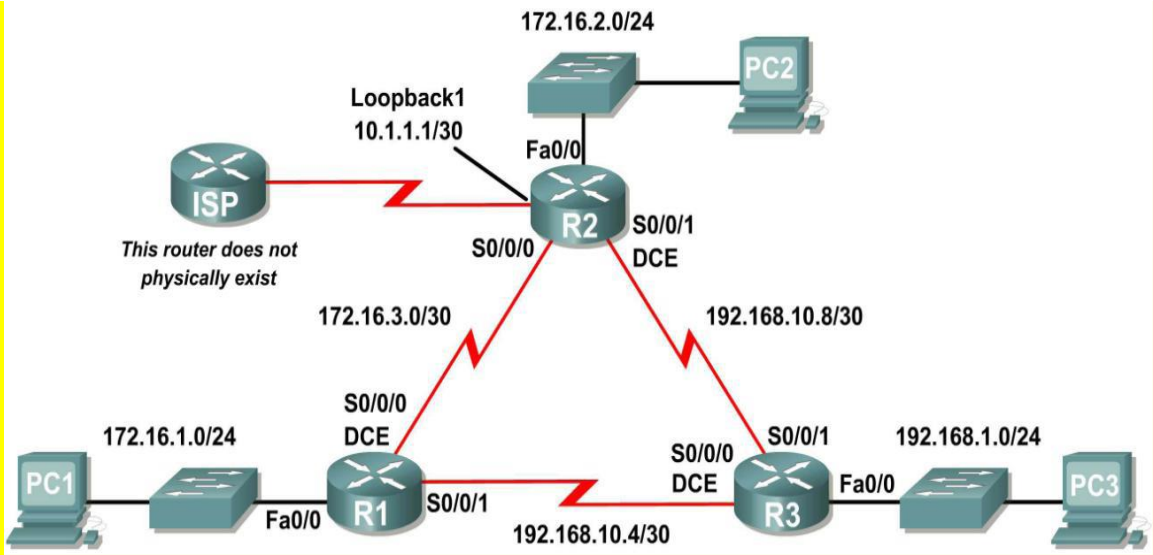
13.0 Basic Route Summarization

Topology Diagram



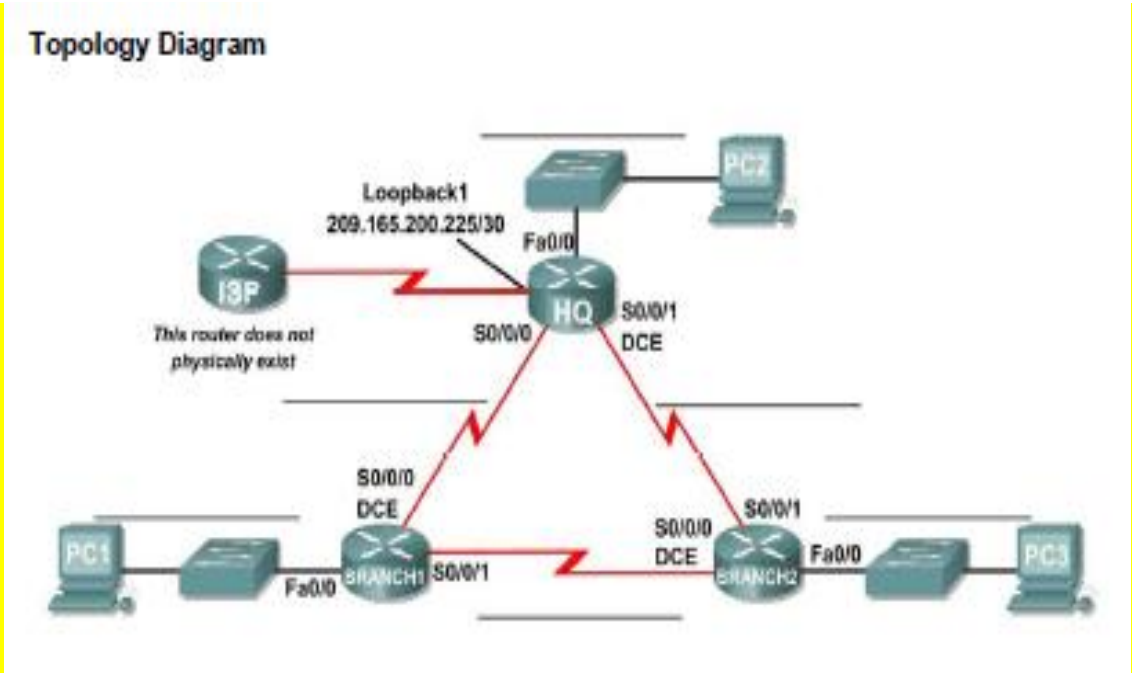
Determine summarized routes that can be used to reduce the size of routing tables

15.0 Basic EIGRP Configuration Lab



- Cable a network according to the Topology Diagram.
- Erase the startup configuration and reload a router to the default state.
- Perform basic configuration tasks on a router.
- Configure and activate interfaces.
- Configure EIGRP routing on all routers.
- Verify EIGRP routing using **show** commands.
- Disable automatic summarization.
- Configure manual summarization.
- Configure a static default route.
- Propagate default route to EIGRP neighbors.
- Document the EIGRP configuration.

16.0 Challenge EIGRP Configuration Lab



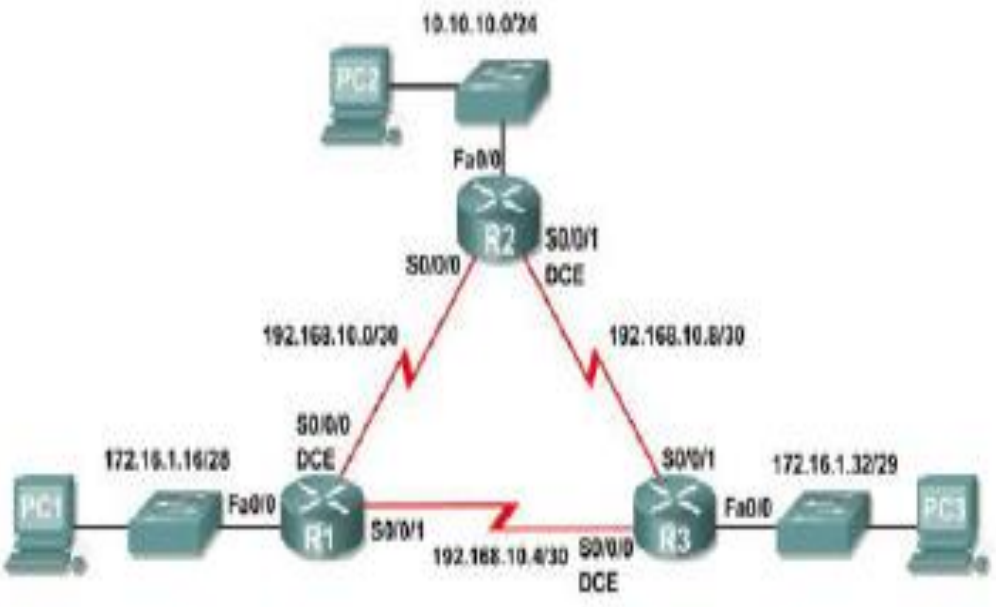
- Create an efficient VLSM design given requirements.
- Assign appropriate addresses to interfaces and document.

- Cable a network according to the Topology Diagram.
- Erase the startup configuration and reload a router to the default state.
- Configure routers including EIGRP.
- Configure and propagate a static default route.
- Verify EIGRP operation.
- Test and verify full connectivity.
- Reflect upon and document the network implementation.

17.0 Basic OSPF Configuration Lab

- Cable a network according to the Topology Diagram
-
-
-
-

Topology Diagram



- Erase the startup configuration and reload a router to the default state
- Perform basic configuration tasks on a router
- Configure and activate interfaces
- Configure OSPF routing on all routers
- Configure OSPF router IDs
- Verify OSPF routing using show commands

- Configure a static default route
- Propagate default route to OSPF neighbors
- Configure OSPF Hello and Dead Timers
- Configure OSPF on a multi-access network, priority and election process

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

STASTICAL ANALYSIS USING R LAB

Course Code	L	T	P	Credit	Semester
MCA 249	-	-	2	1	II

Course Learning Outcomes:

1. Install, Code and Use R Programming Language in R Studio IDE to perform basic tasks on Vectors, Matrices and Data frames.
2. Describe key terminologies, concepts and techniques employed in Statistical Analysis.
3. Define, Calculate, Implement Probability and Probability Distributions to solve a wide variety of problems.
4. Conduct and Interpret a variety of Hypothesis Tests to aid Decision Making.
5. Understand, Analyse, Interpret Correlation and Regression to analyse the underlying relationships between different variables.

Course Content:

1. Introduction to R , Basic Commands , Graphics , Indexing Data , Loading Data ,Additional Graphical and Numerical Summaries,

2. Linear Regression , Libraries, Simple Linear Regression, Multiple Linear Regression, Writing Functions

3. Logistic Regression, LDA, QDA, and KNN , The Stock Market Data , Logistic Regression, Linear Discriminant Analysis, K-Nearest Neighbors.

4. Cross-Validation and the Bootstrap, The Validation Set Approach, Leave-One-Out Cross-Validation, k-Fold Cross-Validation , The Bootstrap.

5. Subset Selection Methods , Best Subset Selection, Forward and Backward Stepwise Selection, Choosing Among Models Using the Validation Set Approach and Cross-Validation.

6. Ridge Regression and the Lasso, Ridge Regression, The Lasso, PCR and PLS Regression, Principal Components Regression, Partial Least Squares.

7.Support Vector Machines, Support Vector Classifier, Support Vector Machine, ROC Curves, SVM with Multiple Classes.

Examination Scheme:

IA	EE

A	PR	LR	V	PR	V
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

MINOR PROJECT

Course Code	L	T	P	Credit	Semester
MCA 250	-	-	-	6	II

Course Learning Outcomes:

CO1. Identify the proposed problem
CO2. Develop a functional application based on the software design
CO3. Apply to code, debugging, and testing tools for implementation
CO4. Prepare the proper documentation for report writing and oral presentation

GUIDELINES FOR PROJECT FILE

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation.

Research is genuine exploration of the unknown that leads to new knowledge, which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals.
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

Report Layout

The report should contain the following components

1. File should be in the following specification

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components

Front Page

Table of Contents
Acknowledgement
Student Certificate
Company Profile
Introduction
Chapters
Appendices
References / Bibliography

- **Title or Cover Page or Front Page**

The title page should contain the following information: Project Title; Student's Name; Course; Year; Supervisor's Name.

- **Table of Contents**

Titles and subtitles are to correspond exactly with those in the text.

- **Acknowledgement**

Acknowledgment to any advisory or financial assistance received in the course of work may be given.

- **Student Certificate**

Given by the Institute.

- **Company Certificate & Profile**

This is a certificate, which the company gives to the students. A Company Profile corresponds to a file with company-specific data. Company data can be stored there and included in a booking when needed.

- **Introduction**

Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

- **Chapters**

All chapters and sections must be appropriately numbered, titled and should neither be too long nor too short in length.
The first chapter should be introductory in nature and should outline the background of the

project, the problem being solved, the importance, other related works and literature survey. The

other chapters would form the body of the report. The last chapter should be concluding in nature

and should also discuss the future prospect of the project.

- **Appendices**

The Appendix contains material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

➢ **References / Bibliography**

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project. Project execution is concerned with assessing how much work has been put in.

The File should fulfill the following ***assessment objectives:***

1. Writing a critical literature review
   - Search for literature
   - Summarizing and presenting the literature
   - Evaluating key content and theories

2. Collecting and analyzing research material
   - Choosing and designing research method
   - Conducting the research
   - Analyzing, sorting and classifying the data to make decision

3. Interpreting research method and draw conclusion
   - Findings
   - Recommendation

4. Assigning the theories and writing the project report
   - Structuring the project in accordance with the given style

5. Bibliography
   - This refer to the books, Journals and other documents consulting while working on the project

Examination Scheme:

Components	**MRP**	**V**	**S**	**FP**	**R**
Weightage (%)	20	20	20	20	20

MRP – Mid Report Presentation, V – Viva, S – Synopsis, FP – Final Presentation, R - Report

Anandam-II

Course Code	L	T	P	Credit	Semester
AND002	-	-	-	2	II

Course Learning Outcomes :

1. Awareness and empathy regarding community issues
2. Interaction with the community and impact on society
3. Interaction with mentor and development of Student teacher relationship
4. Interaction among students, enlarge social network
5. Cooperative and Communication skills and leadership qualities
6. Critical thinking, Confidence and Efficiency

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants,phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.
- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

7. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
8. The group member shall write his/her name at the end of the blog.
9. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
10. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
11. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
12. For the topic chosen by the group, students are recommended to cover the following points:
    g) Current scenario (Regional, national and international level as applicable)
    h) Future predictions
    i) Duty of the government
    j) Government policies (related to the topic), if any
    k) Duty of public
    l) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

4. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
5. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
6. Conclusion is clearly stated. The underlying logic is explicit.

COMMUNICATION SKILLS – II

Course Code	L	T	P	Credit	Semester
BCS211	1	-	-	1	II

Course Learning Outcomes:

1. Investigate strengths and personal insights to be revealed in a Formal Setupof Communication.
2. Create right selection of words and ideas while also choosing the appropriate networking channel for formal communication
3. Recognize the mannerisms and methodology of Interview.

Course Contents:

Module I: Introduction to Speaking Skills
Business Conversation
Effective Public Speaking
Art of Persuasion

Module II: Speaking for Employment
Types of Interview
Styles of Interview
Facing Interviews-Fundamentals and Practice Session
Conducting Interviews- Fundamentals and Practice Session
Question Answer on Various Dimensions

Module III: Basic Telephony Skills
Guidelines for Making a Call
Guidelines for Answering a Call
Telephone Word Groups
Answering Systems and Voice-Mail

Module IV: Work Place Speaking
Team Briefing
Conflict Management
Negotiations
Participation in Meetings
Keynote Speeches

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A
Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Jermy Comfort, Speaking Effectively, et.al, Cambridge
- Krishnaswamy, N, Creative English for Communication, Macmillan
- Raman Prakash, Business Communication, Oxford.
- Taylor, Conversation in Practice.

BEHAVIOURAL SCIENCE-II
(BEHAVIOURAL COMMUNICATION AND RELATIONSHIP MANAGEMENT)

Course Code	L	T	P	Credit	Semester
BSS211	1	-	-	1	II

Course Learning Outcomes:

1. Demonstrate an understanding of interpersonal skills as part of effective communication processes.
2. Identify the effects of behaviour on interpersonal communication
3. Demonstrate a range of effective interpersonal communication skills
4. Use assertiveness and interpersonal skills in the workplace team
5. Utilise effective communication skills to build strong relationships
6. Develop, implement and promote effective communication techniques

Course Contents:

Module I: Components of Excellence

- Personal Excellence:
  - Identifying long-term choices and goals
  - Uncovering the talent, strength & style
- Analyzing choke points in your personal processes by analysis in area of placements, events, seminars, conference, extracurricular activities, projects etc.
- Developing professional power: Goal-setting, time management, handling criticism, interruptions and time wasters

Module II: Professional Excellence

- Alan P. Rossiter's eight aspects of Professional Excellence
- Resilience during challenge and loss
- Continued Reflection (Placements, Events, Seminars, Conferences, Projects, Extracurricular Activities, etc.)

Module III: Career Planning

- Knowing one's Interest and Aptitude
- Identifying available Resources
- Setting goals to maintain focus:
- Developing Positive attributes in personality
  - Self-reliance and Employability skills

Module IV: Professional Success

- Building independence & interdependence
- Reducing resistance to change
- Continued reflection (Placements, events, seminars, conferences, projects extracurricular Activities etc.)

Module V: Stress Management for Healthy Living

- Meaning and Nature of Stress
- Stages of stress
- Causes and Con
- equences of stress: Personal, Organizational and Environmental
- Personal Styles and strategies of coping

Module VI: End-of-Semester Appraisal

- Viva based on personal journal
- Assessment of Behavioural change as a result of training
- Exit Level Rating by Self and Observer

Examination Scheme:

Components	**SAP**	**A**	**Mid Term Test (CT)**	**VIVA**	**Journal for Success (JOS)**
Weightage (%)	20	05	20	30	25

Text & References:

- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer & Company
- Smither Robert D.; The Psychology of Work and Human Performance, 1994, Harper Collins College Publishers
- Raman, A.T. (2003) Knowledge Management: A Resource Book. Excel Books, Delhi.
- Kamalavijayan, D. (2005). Information and Knowledge Management. Macmillan India Ltd. Delhi

FOREIGN LANGUAGE

FRENCH – II

Course Code	L	T	P	Credit	Semester
FLT211	2	-	-	2	II

Course Learning Outcomes:

1. Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
2. Students will be able to read and interpret small texts .
3. Students will be able to communicate in small sentences in writing, self introduction, family description etc.
4. Students will be able to communicate in small sentences in oral, self introduction, family description etc

Course Contents:

Module C: pp. 104 – 139: Unités 8, 9

Contenu lexical: **Unité 8: Découvrir le passé**

1. parler du passé, des habitudes et des changements.
2. parler de la famille, raconter une suite d'événements/préciser leur date et leur durée.
3. connaître quelques moments de l'histoire

Unité 9: Entreprendre

1. faire un projet de la réalisation: (exprimer un besoin, préciser les étapes d'une réalisation)
2. parler d'une entreprise
3. parler du futur

Contenu grammatical:

1. Imparfait
2. Pronom « en »
3. Futur
4. Discours rapporté au présent
5. Passé récent
6. Présent progressif

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1

GERMAN – II

Course Code	L	T	P	Credit	Semester
FLG211	2	-	-	2	II

Course Learning Outcomes:

1. Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
2. Students will be able to read and interpret small texts .
3. Students will be able to communicate in small sentences in writing, self introduction, family description etc.
4. Students will be able to communicate in small sentences in oral, self introduction, family description etc

Course Contents:

Module I: Present perfect tense
Present perfect tense, usage and applicability
Usage of this tense to indicate near past
Universal applicability of this tense in German

Module II: Letter writing
To acquaint the students with the form of writing informal letters.

Module III: Interchanging prepositions
Usage of prepositions with both accusative and dative cases
Usage of verbs fixed with prepositions
Emphasizing on the action and position factor

Module IV: Past tense
Introduction to simple past tense
Learning the verb forms in past tense
Making a list of all verbs in the past tense and the participle forms

Module V: Reading a Fairy Tale
Comprehension and narration

- Rotkäppchen
- Froschprinzessin
- Die Fremdsprache

Module VI: Genitive case
Genitive case – Explain the concept of possession in genitive
Mentioning the structure of weak nouns

Module VII: Genitive prepositions
Discuss the genitive propositions and their usage: (während, wegen, statt, trotz)

Module VIII: Picture Description

Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

Examination Scheme:

Components	**CT1**	**CT2**	**C**	**I**	**V**	**A**
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH – II

Course Code	L	T	P	Credit	Semester
FLS211	2	-	-	2	II

Course Learning Outcomes:

1. Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
2. Students will be able to read and interpret small texts .
3. Students will be able to communicate in small sentences in writing, self introduction, family description etc.
4. Students will be able to communicate in small sentences in oral, self introduction, family description etc.

Course Contents:

Module I
Revision of earlier semester modules
Introduction to Present Continuous Tense (Gerunds)

Module II
Translation with Present Continuous Tense
Introduction to Gustar, Parecer, Apetecer, doler

Module III
Imperatives (positive and negative commands of regular verbs)

Module IV
Commercial/business vocabulary

Module V
Simple conversation with help of texts and vocabulary
En la recepcion del hotel
En el restaurante
En la agencia de viajes
En la tienda/supermercado

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español Sin Fronteras (Nivel – Elemental)

CHINESE – II

Course Code	L	T	P	Credit	Semester
FLC211	2	-	-	2	II

Course Learning Outcomes:

1. To produce global citizens speaking an International language in keeping with the institutional vision .
2. To give students a platform to understand Culture and Society of a different world.
3. To enhance the possibilities of jobs in MNCs established in/outside the country.
4. To enhance the possibilities of Studying Abroad

Course Contents:

Module I

Dialogue Practice
Observe picture and answer the question
Pronunciation and intonation
Character writing and stroke order.
Electronic items

Module II

Traveling – The Scenery is very beautiful
Weather and climate
Grammar question with – "bu shi …. Ma?"
The construction "yao … le" (Used to indicate that an action is going to take place)
Time words "yiqian", "yiwai" (Before and after).
The adverb "geng".

Module III

Going to a friend house for a visit meeting his family and talking about their customs.
Fallen sick and going to the Doctor, the doctor examines, takes temperature and writes prescription.
Aspect particle "guo" shows that an action has happened some time in the past.
Progressive aspect of an actin "zhengzai" Also the use if "zhe" with it.
To welcome someone and to see off someone …. I cant go the airport to see you off… etc.

Module IV

Shipment. Is this the place to checking luggage?
Basic dialogue on – Where do u work?
Basic dialogue on – This is my address
Basic dialogue on – I understand Chinese
Basic dialogue on – What job do u do?
Basic dialogue on – What time is it now?

Module V

Basic dialogue on – What day (date) is it today?
Basic dialogue on – What is the weather like here.
Basic dialogue on – Do u like Chinese food?
Basic dialogue on – I am planning to go to China.

Examination Scheme:

Components	CT1	CT2	C	I	V	A

Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- "Elementary Chinese Reader, Part-2" Lesson 31-38.

ARTIFICIAL INTELLIGENCE

Course Code	L	T	P	Credit	Semester
MCA 301	2	1	-	3	III

Course Learning Outcomes:

CLO1: Able to understand the AI principals and its applications in our world

CLO 2: To understand how search can be performed using search methods based on AI and how they can be implemented for real world problems

CLO 3: To understand Predicate logic that has been used to increase precision in describing and studying structures from linguistics and philosophy to mathematics and computer science.

CLO 4: To be able to understand Fuzzy logic and how it can be use in real world applications to benefit us.

Course Contents:

Module I: Introduction

AI and its importance, AI Problem, Application area.

Module II: Problem Representations

State space representation, problem-reduction representation, production system, production system characteristics, and types of production system.

Module III: Heuristic Search Techniques

AI and search process, brute force search, depth-first search, breadth-first search, time and space complexities, heuristics search, hill climbing, best first search, A*, AO* algorithm, constraint satisfaction, and beam search.

Module IV: Knowledge Representation issues using predicate logic

Representation and mapping, knowledge representation mechanism, inheritable knowledge, Prepositional logic: syntax and semantics, First Order Predicate Logic (FOPL).

Module V: Expert System

Basic understanding of Fuzzy Logic, Artificial Neural Network, Perceptron, Natural Language Processing, Pattern Recognition, Robotics, LISP and Prolog. The role of Artificial intelligence in Biotechnology. Introduction to Bio-inspired computing.

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Artificial Intelligence – II Edition, Elaine Rich, Kevin Knight TMH.

References:

- Foundations of Artificial Intelligence and Expert Systems, V S Janakiraman, K Sarukesi, P Gopalakrishan, Macmillan India Ltd.
- Introduction to AI and Expert System, Dan W. Patterson, PHI.

INFORMATION STORAGE MANAGEMENT (EMC^2)

Course Code	L	T	P	Credit	Semester
MCA 302	2	1	-	3	III

Course Learning Outcomes:

CLO1: Evaluate storage architectures and key data center elements in classic, virtualized and cloud environments.
CLO 2: Explain physical and logical components of a storage infrastructure including storage subsystems, RAID and intelligent storage systems.
CLO 3: Describe understanding and working of storage networking technologies such as DAS, NAS, and SANS.
CLO 4: Articulate business continuity solutions – backup and replication, plus archive for managing fixed content.

Course Contents:

Module I: Storage Concepts

The Need for storage Networks, Storage Devices and Techniques, NAS and SAN, NAS Devices, Advantages and Disadvantages of NAS Devices, SANs, NAS Versus SANs, SAN Standard Organization

Module II: Introduction to DAS

Module III: Introduction to NAS

Module IV: Introduction to Storage Area Networks

Evolution and Benefits of SANs, SAN Components and Building Blocks, SAN Servers, SAN Storage, SAN Interfaces, SAN Interconnections, SAN Software, Data Access over SAN, Fiber Channel Basics: Overview of Fiber Channel Technology, Advantages of the Fiber Channel, Technology, Fiber Channel Ports, Fiber Channel Topology, Fiber Channel Layers, Classes of Service; Fiber Channel Products: HBAs, Fiber Channel Connectors, HUBs, Switches, Fiber Channel Switches Versus Hubs, Bridges, Routers, Storage Devices, Disk Arrays, JBOD, Tape Libraries and Subsystems, Storages Services; Fibre Channel Cabling: Copper-Based Cabling, Fiber-Optic Cabling, Fiber –Optic Connectors, Planning and Implementing Fiber-Optic Cables, Advantages of Fiber-Optic Cabling, Type of Fiber-Optic Cabling

Module V: SAN Topologies

Point –to-Point Topology, FC-AL Topology, Switched Fabric Topology; Designing and Building a SAN; SAN Design Considerations, Designing a SAN, SAN Best Practices; Implementing SAN Security: General Security Guidelines, Securing a SAN, Securing SAN Components, Software-Based Security Measures, Securing Business Environments; Problem Isolation and Management of SANs: Isolating and Troubleshooting Problems, Managing SANs, Disaster Management, Traditional Backup and Restoring, SAN Backup and Restoration, SAN Backup and Restoration Models; iSCSI Technology**:** Emergence of iSCSI Technology, iSCSI Concepts, iSCSI Design Considerations and Security Requirements, iSCSI –The Challenges; Future of SANs: The Need for Change, SAN Technology Development, OSN, IP SANs Storage Service Providers, Non-SAN Technologies, SoIP, NDMP, FCIP, iFCP, DAFS, VI, InfiniBand Architecture

Module VI: Disaster Recovery and Business Continuity

Examination Scheme:

Components	**C T**	**Assignement**	**P/V**	**Quiz**	**Attd**	**EE**
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Storage Area Network Fundamentals, Meeta Gupta, Cisco Press, Pearson Education

References:

- Network Security: The Complete Reference, Roberta Bragg, Mark Rhodes-Ousley, Keith Strassberg, et al - Tata McGraw-Hill presents

ARTIFICIAL INTELLIGENCE LAB

Course Code	L	T	P	Credit	Semester
MCA 321	-	-	2	1	III

Course Learning Outcomes:

1. Able to understand various classical AI algorithms and their implementation.
2. Create methods and programs within the field using relevant programming as well as developing logical and analytical approaches to programming problems independently.
3. Apply his/her knowledge in new areas within field of basic and advanced AI.
4. Developing relevant applications using self logic in the field of programming languages. These methods include performing experiment/programs and interpreting their results.

LIST OF PROGRAMS

S.NO	PROGRAM
1	Study of PROLOG. Write the following programs using PROLOG
2	Write a program to solve 8 queens problem
3	Solve any problem using depth first search.
4	Solve any problem using best first search.
5	Solve 8-puzzle problem using best first search
6	Solve Robot (traversal) problem using means End Analysis
7	Solve traveling salesman problem.

Books for Reference :

- Artificial Intelligence: A Modern Approach,. Russell & Norvig. 1995, Prentice Hall.
- Artificial Intelligence, Elain Rich and Kevin Knight, 1991, TMH.
- Artificial Intelligence-A modern approach, Staurt Russel and peter norvig, 1998, PHI.

- Artificial intelligence, Patrick Henry Winston:, 1992, Addition Wesley 3 Ed.,
- Introduction to prolog.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

SEARCH ENGINE OPTIMIZATION

Course Code	L	T	P	Credit	Semester
MCA 331	2	1	-	3	III

Course Learning Outcomes:

Search engine optimization (SEO) is a set of methods aimed at improving the ranking of a website in search engine listings, and could be considered a subset of Internet or Web marketing.

The primary purpose of SEO is to get higher rankings on search engines which in turn creates a larger target audience.

Course Contents

Module 1

What is SEO?, How Search Engine Works, What is SEO Copywriting?, What is Search Engine Rank?, Ways to optimize web pages (on-page and off-page), Broad Categories of SEO Techniques (White Hat SEO and Black Hat SEO).

Module 2

File Naming Style, URL Subdirectory Name, SEO-Design & Layout, Optimized Keywords (Keyword Frequency, Weight, Proximity, Prominence, Placement), best places to keep keywords, finding keywords, Word Stemming.

Module 3

Metatags, Title optimization, Best practices for creating titles, Optimized Anchors, Importance of Contents, SEO Content Writing, Verifying Website and its importance, W3C Compliance and their rules.

Module 4

Qualities and Task of SEO Expert, Choosing an SEO Expert / Company, Link Building and how to increase link popularity, Mobile SEO and its techniques, Dos and Don'ts of SEO.

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text and References:

- Introduction to Search Engine Optimization: A Guide for Absolute Beginners By Todd Kelsey, Brandon Lyon, Apress
- The Art of SEO Mastering Search Engine Optimization By Eric Enge, Stephan Spencer, Jessie Stricchiola, Rand Fishkin, O Reilly Media Inc.
- Search Engine Optimization: Building Traffic and Making Money with SEO by Harold Davis, O Reilly Media Inc.
- Search Engine Optimization (SEO): An Hour a Day By Jennifer Grappone, Gradiva Couzin, John Wiley & Sons
- Search Engine Optimization Bible By Jerri L. Ledford Wiley Publishing Inc.

- Basic Search Engine Optimization Is Fundamental and Essential: Legal Precedants of Search Engine Optimization

DIGITAL MARKETING ANALYTICS

Course Code	L	T	P	Credit	Semester
MCA-332	2	1	-	3	III

Course Learning Outcomes:

1.Become familiar with a range of data tools and resources.
2.Use data to develop marketing strategy to create touch points from top to bottom funnel. 3.Set key performance indicators for each individual marketing channel. Analyze data to measure performance through various marketing channels.

Course Description ; With the rapid shift of marketing away from traditional media to online platforms, it is becoming increasingly important for the students to be well-versed in digital marketing fundamentals.

Digital Marketing : Introduction

Key Concepts of Digital Marketing, Definition of the DMI Method, Principles, Our Tools, The DMI Framework, Traditional v. Digital Marketing, The Opportunity of Digital Marketing, Characteristics of Digital Marketing, Implication of Digital Marketing, Market Research v. Market Reality.

Search Engine Optimization (SEO)

Key SEO Concepts **:** Search Results & Position, Benefits of Search Position, Stakeholders in Search, Mechanics of Search, On-Page Optimisation, The SEO Process, Customer Insights, Analysis & Review, Keyword Research & Selection, Content Updates & Layout, Meta Tags, SEO Site Map, SEO Webmaster Tools

Online Advertising:

MOBILE MARKETING : Mobile Devices, SMS Content, SMS Strategy, Mobile Advertising, Mobile Optimised Websites, Mobile Apps; EMAIL MARKETING : Campaign Process, Online Data Capture, Offline Data Capture, Segmentation, Email Design, User Behavior, User Characteristics, Email Copy, Email Structure, Email Delivery, Email Systems

Web Analytics

Planning, Situation Analysis, Information Gathering, Target Audience, Analytics Code, Analytics Profiles, Goal Configuration & Funnels, Audience, Dashboard, Technology, Advertising, Adwords Campaigns, Traffic Sources, Laws & Guidelines.

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Textbook :

"**Beginner's Textbook for Digital Marketing & Analytics"**

Website Link:

- SEOMoz.org
- mashable.com http://www.convinceandconvert.
- ClickZ.com
- forrester.com
- contentmarketinginstitute.com

COMPILER DESIGN

Course Code	L	T	P	Credit	Semester
MCA-333	2	1	-	3	III

Course Learning Outcomes :

The Objectives of this course is to explore the principles, algorithms, and data structures involved in the design and construction of compilers.
Topics include context-free grammars, lexical analysis, parsing techniques, symbol tables, error recovery, code generation, and code optimization.

Course Contents:

Module I: Introduction

Introduction to Compliers, Classification of grammars, Context free grammars, Regular grammars, Deterministic finite State Automata (DFA) & Non-DFA.

Module II: Syntax Analysis

Scanners, Top down parsing, LL grammars, Bottom up parsing, Polish expression Operator Precedence grammar, IR grammars, Comparison of parsing methods, Error handling.

Module III: Symbol Table

Symbol table handling techniques, Organization for non-block and block structured languages.

Module IV: Code Generation/Intermediate Code Generation

Run time storage administration, Static and dynamic allocation, Intermediate forms of source program, Polish N-tuple and syntax trees, Semantic analysis and code generation.

Module V: Code Optimization

Code optimization, Folding, redundant sub-expression evaluation, Optimization within iterative loops.

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Principles of Compiler Design, Alfred V. Aho, Jeffrey D. Ullman, Narosa Publishing House
- Compilers Principles, Techniques & Tools, Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman, Pearson Education (Singapore)

References:

- The Theory and Practice of Compiler Writing, Tremblay, et. al., McGraw Hill, New York, 1985.

DIGITAL IMAGE PROCESSING

Course Code	L	T	P	Credit	Semester
MCA-334	2	1	-	3	III

Course Learning Outcomes :

To introduce the concepts of image processing and basic analytical methods to be used in image processing. To familiarize students with image enhancement and restoration techniques, To explain different image compression techniques. To introduce segmentation and morphological processing techniques.

Course Contents:

Module I: Introduction and Digital Image Fundamentals

The origins of Digital Image Processing, Examples of Fields that Use Digital Image Processing, Fundamentals Steps in Image Processing, Elements of Digital Image Processing Systems, Image Sampling and Quantization, Some basic relationships like Neighbours, Connectivity, Distance Measures between pixels, Linear and Non Linear Operations.

Module II: Image Enhancement in the Spatial Domain

Some basic Gray Level Transformations, Histogram Processing, Enhancement Using Arithmetic and Logic operations, Basics of Spatial Filters, Smoothening and Sharpening Spatial Filters, Combining Spatial Enhancement Methods.

Module III: Image Enhancement in the Frequency Domain:

Introduction to Fourier Transform and the frequency Domain, Smoothing and Sharpening Frequency Domain Filters, Homomorphic Filtering.

Image Restoration:A model of The Image Degradation / Restoration Process, Noise Models, Restoration in the presence of Noise Only Spatial Filtering, Pereodic Noise Reduction by Frequency Domain Filtering, Linear Position-Invarient Dedradations, Estimation of Degradation Function, Inverse filtering, Wiener filtering, Constrained Least Square Filtering, Geometric Mean Filter, Geometric Transformations.

Module IV: Image Compression

Coding, Interpixel and Psychovisual Redundancy, Image Compression models, Elements of Information Theory, Error free comparison, Lossy compression, Image compression standards.

Image Segmentation: Detection of Discontinuities, Edge linking and boundary detection, Threshold, Region Oriented Segmentation, Motion based segmentation.

Module V: Representation and Description

Representation, Boundary Descriptors, Regional Descriptors, Use of Principal Components for Description, Introduction to Morphology, Some basic Morphological Algorithms.

Object Recognition: Patterns and Pattern Classes, Decision-Theoretic Methods, Structural Methods

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Rafael C. Conzalez & Richard E. Woods, "Digital Image Processing", 2nd edition, Pearson Education.
- K. Jain, "Fundamental of Digital Image Processing", PHI.

References:

- Rosefield Kak, "Digital Picture Processing",
- W.K. Pratt, "Digital Image Processing",

SALESFORCE TECHNOLOGY

Course Code	L	T	P	Credit	Semester
MCA-335	2	1	-	3	III

Course Learning Outcomes:

What is the use of Salesforce technology?
Salesforce is a cloud computing service as a software (SaaS) company that specializes in customer relationship management (CRM). Salesforce's services allow businesses to use cloud technology to better connect with customers, partners and potential customers

Course Content

Module I

Introduction to Salesforce, Salesforce framework, Salesforce- Sales Cloud and Service Cloud, Salesforce objects, Salesforce - Control Access Organization, Home page components: Working with Home Page Components and Custom Links, features and functionality associated with the Salesforce home page along with HTML, CSS, and JavaScript code. Advanced User Interface and the native Salesforce user interface, add graphical elements by using images, HTML, CSS, JavaScript, and Visualforce.

Module II

Salesforce CRM: Standard functionality and elements of Salesforce CRM using HTML and JavaScript. Automating Salesforce CRM, data management using Salesforce workflow and formulas. Improving Data Quality in Salesforce CRM, Salesforce CRM validation rule mechanism. Implementation of Approval Processes, Salesforce CRM approval mechanism.

Module III

Productivity Tools for Superusers and Advanced Administration, custom fields & unique properties Data Utilities, custom reports, storage utilization, Analytics, advanced filters, Create dashboards , The AppExchange, Marketing Administration, integrated campaign builder, Service & Support Administration, the Salesforce Console, custom objects, custom tabs, custom Web tabs**,** custom app, Applications for Multiple Users, Chatter.

Module IV

Visualforce framework, Incorporate Visualforce pages into Salesforce and vice versa, Visualforce standard controllers, creating custom controllers or extensions, Designing Applications on Force.com, building a data model, Custom Object tab, Page Layout, and Customization options, Employ OWD, Apply profiles, OWDs, role hierarchy, Apply OWDs, Implementing Business Processes, the vlookup, regex, ischanged, isnew, and priorvalue functions, Managing Data, use of upsert, data management tools and the API-based tools, the Data Loader, create mapping files and upsert data.

Module V

Sandboxes for development, Configuring and Installing Salesforce for Outlook E-mail Integration, Integrating Salesforce CRM with External Online Tools, using HTML, CSS, JavaScript, and Visualforce. Use Salesforce on Mobile Devices.

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE

Weightage (%)	15	10	10	10	5	50

Text & References:

Text

- *Force.com Fundamentals by Salesforce Developers Press*
- *Practical Salesforce.com Development Without Code by Philip Weinmeister*

References:

- https://www.tutorialspoint.com/salesforce/salesforce_pdf_version.htm (Online Tutorial)

LAN SWITCHING AND WIRELESS

Course Code	L	T	P	Credit	Semester
MCA-336	2	1	-	3	III

Course Learning Outcomes:

Switches that provide a separate connection for each node in a company's internal network are called LAN switches. Essentially, a LAN switch creates a series of instant networks that contain only the two devices communicating with each other at that particular moment.

Course Contents:

Module I: LAN Design

Switched LAN Architecture, Principles of Hierarchical Network Design, Matching Switches to Specific LAN Function

Module II: Basic Switch Concepts and Configuration

Introduction to Ethernet/ 802.3 LAN, Forward Frame Using a Switch, Switch Management Configuration, Configuring Switch Security,

Module III: VLANs

Introducing VLAN, VLAN Trunking, Configuring VLAN and Trunks', Trouble Shooting VLANs and Trunks

Module IV: VTP

VTP Concept, VTP Operation, Configure VTP

Module V: STP

Redundant Layer 2 Topology, Introduction to STP, STP Convergence, PVSTP+, RSTP and Paired PVSTP+

Module VI: Inter-VLAN Routing

Inter- VLAN Routing, Configuring Inter-VLAN Routing, Trouble Shooting Inter-VLAN Rioting

Module VII: Basic Wireless Concepts and Configuration

The Wireless LAN, Wireless LAN Security, Configuring Wireless LAN Access, Trouble Shooting Simple WLAN Problems

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text

- Cisco Networking Academy Programme CCNA 3 & 4 Companion Guide, 3rd Edn by Pearson Education
- Cisco Networking Academy Programme CCNA 3 & 4 Lab Companion, 3rd Edn by Pearson Education

References:

- Cisco Networking Academy Programme CCNA 3 & 4 Engineering General, 3rd Edn by Pearson Education
- Data Communications and Networking by Behrouz Forouzan, 3e, Tata McGraw-Hill

- Computer Networks by Andrews S. Tanenbaum, 4e, Pearson Education

PYTHON

Course Code	L	T	P/FW	CREDITS	Semester
MCA337	2	1	-	3	III

Course Learning Objective:

1.Recognize the python programming problem solution and its implementation.

2. Identify the tools for python programming.

3. Describe the concept of different library functions and its utilization.

4. Apply knowledge of python programming techniques to solve computer problems.

Course Contents:

Module-I

Introduction to Python- features and basic syntax, interactive shell, editing, saving, and running a script. The concept of data types; variables, assignments; immutable variables; numerical types; arithmetic operators and expressions; understanding error messages; Conditions, boolean logic, logical operators; ranges; Control statements: if-else, loops (for, while); short-circuit (lazy) evaluation

Module-II

Strings and text files; manipulating files and directories; text files: reading/writing text and numbers from/to a file; creating and reading a formatted file.
String manipulations: subscript operator, indexing, slicing a string; strings and number system: converting strings to numbers and vice versa. Binary, octal, hexadecimal numbers

Module-III

Lists, tuples, and dictionaries; basic list operators, replacing, inserting, removing an element; searching and sorting lists; dictionary literals, adding and removing keys, accessing and replacing values; traversing dictionaries. Design with functions: hiding redundancy, complexity; arguments and return values; formal vs actual arguments, named arguments. Recursive functions.

Module-IV

Simple graphics and image processing: “turtle” module; simple 2d drawing - colors, shapes; digital images, image file formats, image processing; Simple image manipulations with 'image' module - convert to bw, greyscale, blur, etc.

Module-V

Classes and OOP: classes, objects, attributes and methods; defining classes; design with classes, data modeling; persistent storage of objects; inheritance, polymorphism, operator overloading; abstract classes; exception handling, try block

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Textbook: *Fundamentals of Python: First Programs* , Author: Kenneth Lambert , Publisher: Course Technology, Cengage Learning, 2012

BIG DATA AND ANALYTICS USING R

Course Code	L	T	P	Credit	Semester
MCA338	2	1	-	3	III

Course Learning Outcomes

What is the major objective of big data?
Big data analytics helps organizations harness their data and use it to identify new opportunities. That, in turn, leads to smarter business moves, more efficient operations, higher profits and happier customers.

Course Contents:

Module I: INTRODUCTION TO BIG DATA AND HADOOP
Types of Digital Data, Introduction to Big Data, Big Data Analytics, History of Hadoop, Apache Hadoop, Analysing Data with Unix tools, Analysing Data with Hadoop, Hadoop Streaming, Hadoop Echo System, IBM Big Data Strategy, Introduction to Infosphere BigInsights and Big Sheets.

Module II : HDFS(Hadoop Distributed File System)
The Design of HDFS, HDFS Concepts, Command Line Interface, Hadoop file system interfaces, Data flow, Data Ingest with Flume and Scoop and Hadoop archives, Hadoop I/O: Compression, Serialization, Avro and File-Based Data structures.

Module III : Map Reduce
Anatomy of a Map Reduce Job Run, Failures, Job Scheduling, Shuffle and Sort, Task Execution, Map Reduce Types and Formats, Map Reduce Features.

Module IV : Hadoop Eco System
Pig : Introduction to PIG, Execution Modes of Pig, Comparison of Pig with Databases, Grunt, Pig Latin, User Defined Functions, Data Processing operators. Hive : Hive Shell, Hive Services, Hive Metastore, Comparison with Traditional Databases, HiveQL, Tables, Querying Data and User Defined Functions. Hbase : HBasics, Concepts, Clients, Example, Hbase Versus RDBMS. Big SQL : Introduction

UNIT V : Data Analytics with R
Reading and getting data into R, ordered and unordered factors, arrays and matrices, lists and data frames, reading data from files, probability distributions, statistical models in R, Manipulating objects, data distribution. Using Machine learning Algorithms with R.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, "Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data", McGrawHill Publishing, 2012

- Bill Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", JohnWiley & sons, 2012.
- Glenn J. Myatt, "Making Sense of Data", John Wiley & Sons, 2007
- Paul Zikopoulos ,Dirk deRoos , Krishnan Parasuraman , Thomas Deutsch , James Giles , David Corrigan , Harness the Power of Big Data The IBM Big Data Platform, Tata McGraw Hill Publications, 2012

ANDROID PROGRAMMING

Course Code	L	T	P	Credit	Semester
MCA339	2	1	-	3	III

Course Learning Outcomes

1. Install and configure Android application development tools.
2. Design and develop user Interfaces for the Android platform.
3. Save state information across important operating system events.
4. Apply Java programming concepts to Android application development

Course Contents

Module –I: Basics of Android

What is Android, History and Version, Installing softwares , Setup Eclipse, Hello Android example,Internal Details, Dalvik VM , Software Stack , Android Core Building Blocks , Android Emulator , AndroidManifest.xml , R.java file , Hide Title Bar , Screen Orientation

Module –II: UI Widgets

Working with Button, Toast, Custom Toast, Button, Toggle Button, Switch Button, Image Button, CheckBox, AlertDialog, Spinner, AutoCompleteTextView, RatingBar, DatePicker, TimePicker, ProgressBar, Quick Contact Budge, Analog Clock and Digital Clock, Working with hardware Button, File Download,

Module –III: Activity, Intent & Fragment

Activity Lifecycle, Activity Example, Implicit Intent, Explicit Intent, Fragment Lifecycle, Fragment Example, Dynamic Fragment,

Module –IV: Android Menu & Layout Manager

Option Menu, Context Menu, Popup Menu , Relative Layout, Linear Layout, Table Layout, Grid Layout

Module –V: Adaptor & Views

Array Adaptor, ArrayList Adaptor, Base Adaptor, GridView , WebView , ScrollView , SearchView , TabHost , DynamicListView , ExpandedListView

Examination Scheme:

Components	C T	Assignement	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & Reference:

- Android Programming: The Big Nerd Ranch Guide (Big Nerd Ranch Guides) (By: Bill Philips & Brian Hardy
- Android Recipes: A Problem-Solution Approach, Dave Smith & Jeff Friesen

LAN SWITCHING AND WIRELESS LAB

Course Code	L	T	P	Credit	Semester
MCA346	-	-	2	1	III

Course Learning Outcomes :

Switches that provide a separate connection for each node in a company's internal network are called LAN switches. Essentially, a LAN switch creates a series of instant networks that contain only the two devices communicating with each other at that particular moment.

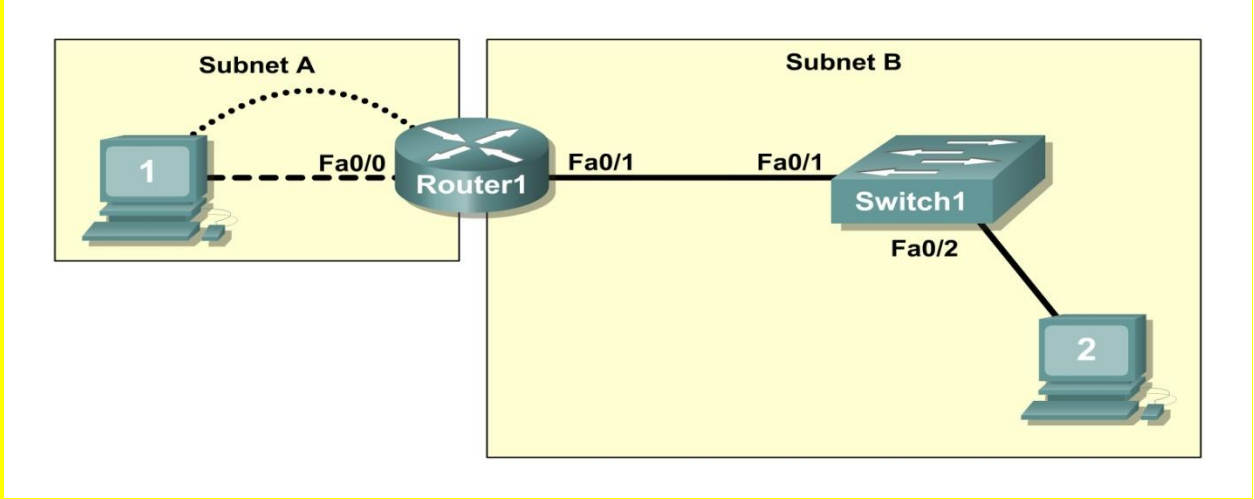
Course Contents:

Lab I: Review of Concepts from Exploration 1

- Create a logical topology given network requirements
- Create subnets to meet host requirements
- Configure the physical topology
- Configure the logical topology
- Verify network connectivity
- Configure and verify passwords

Lab II: Troubleshooting a Small Network

Topology Diagram



- Verify that a paper design meets stated network requirements
- Cable a network according to the topology diagram
- Erase the startup configuration and reload a router to the default state
- Load the routers with supplied scripts
- Discover where communication is not possible
- Gather information about the misconfigured portion of the network along with any other errors
- Analyze information to determine why communication is not possible
- Propose solutions to network errors
- Implement solutions to network errors

Examine the Logical LAN Topology

The IP address block of 172.16.30.0 /23 is subnetted to meet the following requirements:

Subnet	Number of Hosts
Subnet A	174
Subnet B	60

Additional requirements and specifications:

- The 0 subnet is used.
- The smallest possible number of subnets that satisfy the requirements for hosts should be used, keeping the largest possible block in reserve for future use.
- Assign the first usable subnet to Subnet A.
- Host computers use the first IP address in the subnet. The network router uses the last network host address.

Based on these requirements, the following topology has been provided to you:

Subnet A	
Specification	**Value**
IP mask (decimal)	255.255.255.0
IP address	172.16.30.0
First IP host address	172.16.30.1
Last IP host address	172.16.30.254

Subnet B	
Specification	**Value**
IP mask (decimal)	255.255.255.128
IP address	172.16.31.0
First IP host address	172.16.31.1
Last IP host address	172.16.31.126

Examine each of the values in the tables above and verify that this topology meets all requirements and specifications. Are any of the given values incorrect? _____

If yes, correct the values in the table above and write the corrected values below:

_____

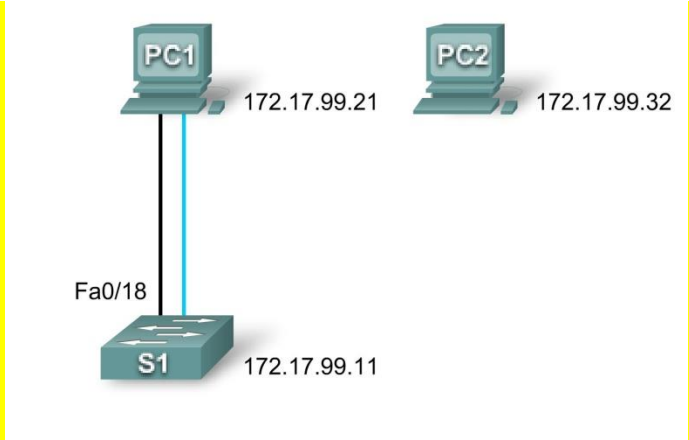
_____

Create a configuration table similar to the one below using your corrected values:

Device	IP address	Mask	Gateway
Host1	172.16.30.1	255.255.255.0	172.16.30.254
Router1–Fa0/0	172.16.30.254	255.255.255.0	N/A
Host2	172.16.31.1	255.255.255.128	172.16.31.126
Router1–	172.16.31.126	255.255.255.128	N/A

Fa0/1			

Lab III: Basic Switch Configuration



Addressing Table

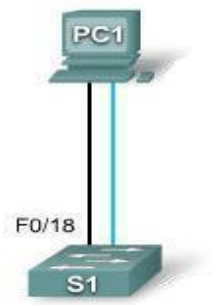
Device	Interface	IP Address	Subnet Mask	Default Gateway
PC1	**NIC**	172.17.99.21	255.255.255.0	172.17.99.1
PC2	**NIC**	172.17.99.32	255.255.255.0	172.17.99.1
S1	**VLAN99**	172.17.99.11	255.255.255.0	172.17.99.1

Learning Objectives

- Cable a network according to the topology diagram
- Clear an existing configuration on a switch
- Examine and verify the default configuration
- Create a basic switch configuration, including a name and an IP address
- Configure passwords to ensure that access to the CLI is secured
- Configure switch port speed and duplex properties for an interface
- Configure basic switch port security
- Manage the MAC address table
- Assign static MAC addresses
- Add and move hosts on a switch

LAB IV: Managing Switch Operating System and Configuration Files

Topology Diagram



Addressing Table

Device	Hostname	Interface	IP Address	Subnet Mask	Default Gateway
PC1	Host-A	NIC	172.17.99.21	255.255.255.0	172.17.99.1
S1	ALSwitch	VLAN99	172.17.99.11	255.255.255.0	172.17.99.1

Learning Objectives

- Create and save a basic switch configuration
- Set up a TFTP server on the network
- Back up the switch Cisco IOS software to a TFTP server and then restore it
- Back up the switch configuration to a TFTP server
- Configure a switch to load a configuration from a TFTP server
- Upgrade the Cisco IOS software from a TFTP server

Lab V: Basic VLAN Configuration

Topology Diagram

Addressing Table

Device (Hostname)	Interface	IP Address	Subnet Mask	Default Gateway
S1	**VLAN 99**	172.17.99.11	255.255.255.0	N/A
S2	**VLAN 99**	172.17.99.12	255.255.255.0	N/A
S3	**VLAN 99**	172.17.99.13	255.255.255.0	N/A
PC1	**NIC**	172.17.10.21	255.255.255.0	172.17.10.1

PC2	**NIC**	172.17.20.22	255.255.255.0	172.17.20.1
PC3	**NIC**	172.17.30.23	255.255.255.0	172.17.30.1
PC4	**NIC**	172.17.10.24	255.255.255.0	172.17.10.1
PC5	**NIC**	172.17.20.25	255.255.255.0	172.17.20.1
PC6	**NIC**	172.17.30.26	255.255.255.0	172.17.30.1

Initial Port Assignments (Switches 2 and 3)

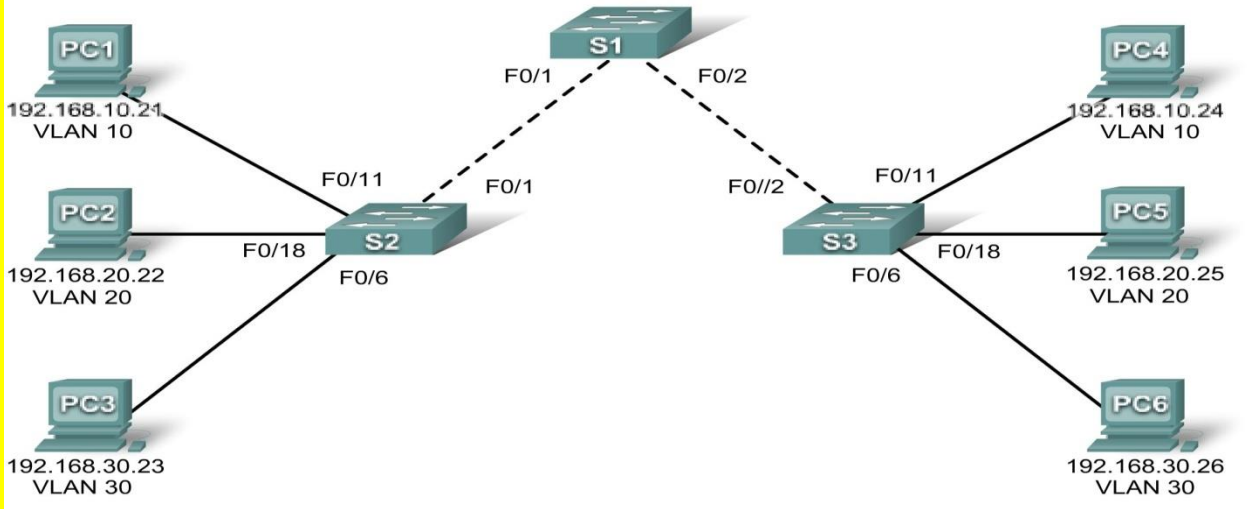
Ports	Assignment	Network
Fa0/1 – 0/5	802.1q Trunks (Native VLAN 99)	172.17.99.0 /24
Fa0/6 – 0/10	VLAN 30 – Guest (Default)	172.17.30.0 /24
Fa0/11 – 0/17	VLAN 10 – Faculty/Staff	172.17.10.0 /24
Fa0/18 – 0/24	VLAN 20 – Students	172.17.20.0 /24

Learning Objectives

- Cable a network according to the topology diagram
- Erase the startup configuration and reload a switch to the default state
- Perform basic configuration tasks on a switch
- Create VLANs
- Assign switch ports to a VLAN
- Add, move, and change ports
- Verify VLAN configuration
- Enable trunking on inter-switch connections
- Verify trunk configuration
- Save the VLAN configuration

Lab VI: Troubleshooting VLAN Configurations

Topology Diagram



Addressing Table

Device (Hostname)	Interface	IP Address	Subnet Mask	Default Gateway
S1	**VLAN 56**	192.168.56.11	255.255.255.0	N/A
S2	**VLAN 56**	192.168.56.12	255.255.255.0	N/A
S3	**VLAN 56**	192.168.56.13	255.255.255.0	N/A
PC1	**NIC**	192.168.10.21	255.255.255.0	192.168.10.1

PC2	**NIC**	192.168.20.22	255.255.255.0	192.168.20.1
PC3	**NIC**	192.168.30.23	255.255.255.0	192.168.30.1
PC4	**NIC**	192.168.10.24	255.255.255.0	192.168.10.1
PC5	**NIC**	192.168.20.25	255.255.255.0	192.168.20.1
PC6	**NIC**	192.168.30.26	255.255.255.0	192.168.30.1

Initial Port Assignments (Switches 2 and 3)

Ports	Assignment	Network
Fa0/1 – 0/5	802.1q Trunks (Native VLAN 56)	192.168.56.0 /24
Fa0/6 – 0/10	VLAN 30 – Guest (Default)	192.168.30.0 /24
Fa0/11 – 0/17	VLAN 10 – Faculty/Staff	192.168.10.0 /24
Fa0/18 – 0/24	VLAN 20 – Students	192.168.20.0 /24

In this lab, you will practice troubleshooting a misconfigured VLAN environment. Load or have your instructor load the configurations below into your lab gear. Your objective is to locate and correct any and all errors in the configurations and establish end-to-end connectivity. Your final configuration should match the topology diagram and addressing table. All passwords are set to **cisco**, except the enable secret password, which is set to **class**.

Task 1: Prepare the Network

Step 1: Cable a network that is similar to the one in the topology diagram.

Step 2: Clear any existing configurations on the switches, and initialize all ports in the shutdown state.

Step 3: Import the configurations below.

Switch 1

```
hostname S1
no ip domain-lookup
enable secret class
!
!
interface range FastEthernet0/1-5
 switchport mode trunk
!
interface range FastEthernet0/6-24
 shutdown
!
interface Vlan1
 no ip address
 no ip route-cache
!
interface Vlan56
 ip address 192.168.56.11 255.255.255.0
 no ip route-cache
!
line con 0
 logging synchronous
line vty 0 4
 no login
line vty 5 15
 password cisco
 login
!
```

```
end
```

Switch 2

```
hostname S2
no ip domain-lookup
enable secret class
!
vlan 10,20,30,56
!
interface range FastEthernet0/1-5
 switchport trunk native vlan 56
 switchport mode access
!
interface range FastEthernet0/6-10
 switchport access vlan 30
 switchport mode access
!
interface range FastEthernet0/11-17
 switchport access vlan 10
 switchport mode access
!
interface range FastEthernet0/18-24
 switchport access vlan 20
 switchport mode access
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 ip address 192.168.56.12 255.255.255.0
 no ip route-cache
 shutdown
!
line con 0
 password cisco
 login
line vty 0 4
 password cisco
 login
line vty 5 15
 password cisco
 login
!
end
```

Switch 3

```
hostname S3
no ip domain-lookup
enable secret class
!
vlan 10,20,30
```

```
!
interface range FastEthernet0/1-5
 switchport trunk native vlan 56
 switchport mode trunk
!
interface range FastEthernet0/6-10
 switchport mode access
!
interface range FastEthernet0/11-17
 switchport mode access
!
interface range FastEthernet0/18-24
 switchport mode access
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 no ip route-cache
 shutdown
!
interface Vlan56
 no ip route-cache
!
line con 0
 password cisco
 login
line vty 0 4
 password cisco
 login
line vty 5 15
 password cisco
 login
!
end
```

Task 2: Troubleshoot and Repair the VLAN Configuration

Task 3: Document the Switch Configurations

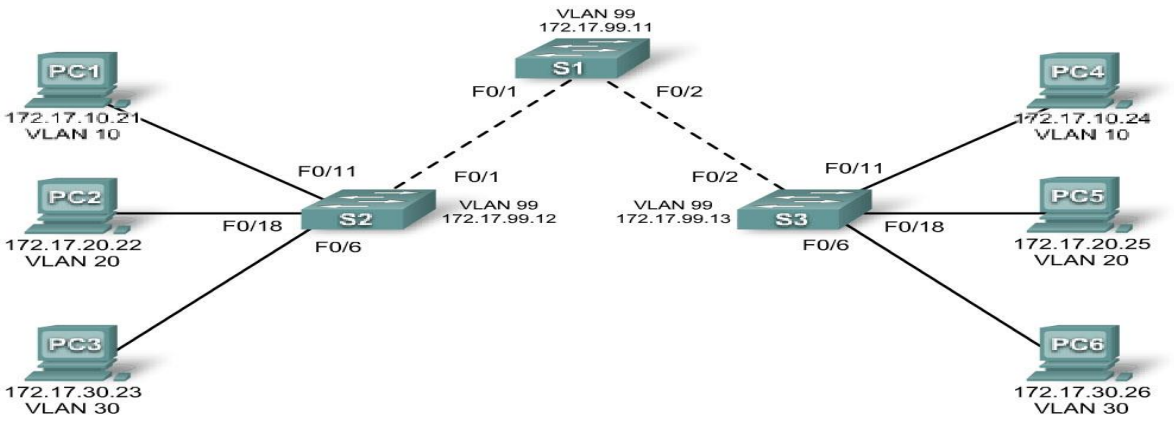
On each switch, capture the running configuration to a text file and save for future reference:

Task 4: Clean Up

Erase the configurations and reload the switches. Disconnect and store the cabling. For PC hosts that are normally connected to other networks (such as the school LAN or to the Internet), reconnect the appropriate cabling and restore the TCP/IP settings.

Lab VII: Basic VTP Configuration

Topology Diagram


VLAN 99
172.17.99.11
S1
F0/1
F0/2
PC1
172.17.10.21
VLAN 10
PC2
172.17.20.22
VLAN 20
PC3
172.17.30.23
VLAN 30
F0/11
F0/1
F0/18
S2
VLAN 99
172.17.99.12
F0/6
VLAN 99
172.17.99.13
F0/2
F0/11
S3
F0/18
F0/6
PC4
172.17.10.24
VLAN 10
PC5
172.17.20.25
VLAN 20
PC6
172.17.30.26
VLAN 30

Addressing Table

Device (Hostname)	Interface	IP Address	Subnet Mask	Default Gateway
S1	**VLAN 99**	172.17.99.11	255.255.255.0	N/A
S2	**VLAN 99**	172.17.99.12	255.255.255.0	N/A
S3	**VLAN 99**	172.17.99.13	255.255.255.0	N/A
PC1	**NIC**	172.17.10.21	255.255.255.0	172.17.10.1
PC2	**NIC**	172.17.20.22	255.255.255.0	172.17.20.1
PC3	**NIC**	172.17.30.23	255.255.255.0	172.17.30.1
PC4	**NIC**	172.17.10.24	255.255.255.0	172.17.10.1
PC5	**NIC**	172.17.20.25	255.255.255.0	172.17.20.1
PC6	**NIC**	172.17.30.26	255.255.255.0	172.17.30.1

Port Assignments (Switches 2 and 3)

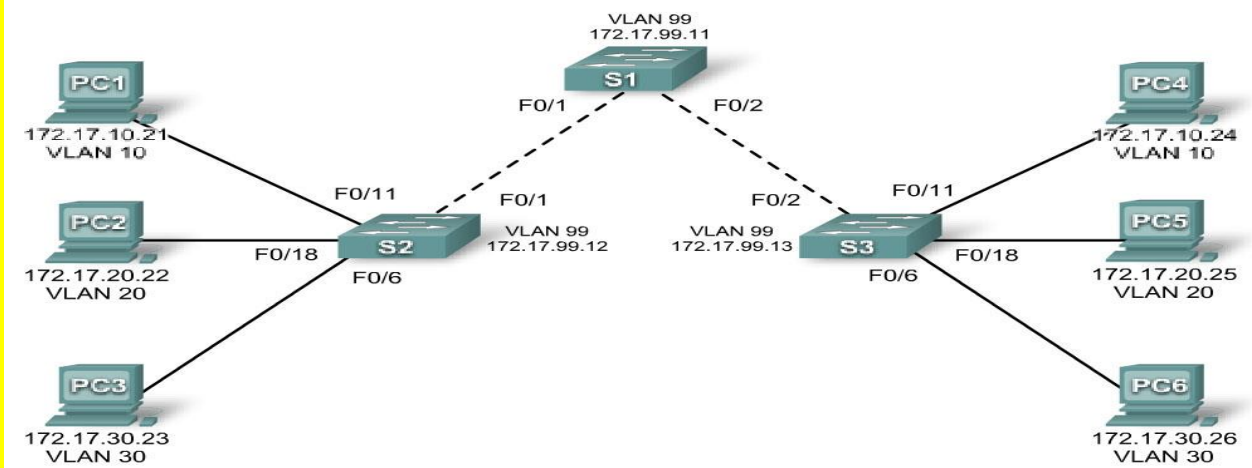
Ports	Assignment	Network
Fa0/1 – 0/5	802.1q Trunks (Native VLAN 99)	172.17.99.0 /24
Fa0/6 – 0/10	VLAN 30 – Guest (Default)	172.17.30.0 /24
Fa0/11 – 0/17	VLAN 10 – Faculty/Staff	172.17.10.0 /24
Fa0/18 – 0/24	VLAN 20 – Students	172.17.20.0 /24

Learning Objectives

- Cable a network according to the topology diagram
- Erase the startup configuration and reload a switch to the default state
- Perform basic configuration tasks on a switch
- Configure VLAN Trunking Protocol (VTP) on all switches
- Enable trunking on inter-switch connections
- Verify trunk configuration
- Modify VTP modes and observe the impact
- Create VLANs on the VTP server, and distribute this VLAN information to switches in the network
- Explain the differences in operation between VTP transparent mode, server mode, and client mode
- Assign switch ports to the VLANs
- Save the VLAN configuration
- Enable VTP pruning on the network
- Explain how pruning reduces unnecessary broadcast traffic on the LAN

Lab VIII: Troubleshooting VTP Configuration

Topology Diagram



Addressing Table

Device (Hostname)	Interface	IP Address	Subnet Mask
S1	**VLAN 99**	172.17.99.11	255.255.255.0
S2	**VLAN 99**	172.17.99.12	255.255.255.0
S3	**VLAN 99**	172.17.99.13	255.255.255.0
PC1	**NIC**	172.17.10.21	255.255.255.0
PC2	**NIC**	172.17.20.22	255.255.255.0
PC3	**NIC**	172.17.30.23	255.255.255.0
PC4	**NIC**	172.17.10.24	255.255.255.0
PC5	**NIC**	172.17.20.25	255.255.255.0
PC6	**NIC**	172.17.30.26	255.255.255.0

Port Assignments (Switches 2 and 3)

Ports	Assignment	Network
Fa0/1 – 0/5	802.1q Trunks (Native VLAN 99)	172.17.99.0 /24
Fa0/6 – 0/10	VLAN 30 – Guest (Default)	172.17.30.0 /24
Fa0/11 – 0/17	VLAN 10 – Faculty/Staff	172.17.10.0 /24
Fa0/18 – 0/24	VLAN 20 – Students	172.17.20.0 /24

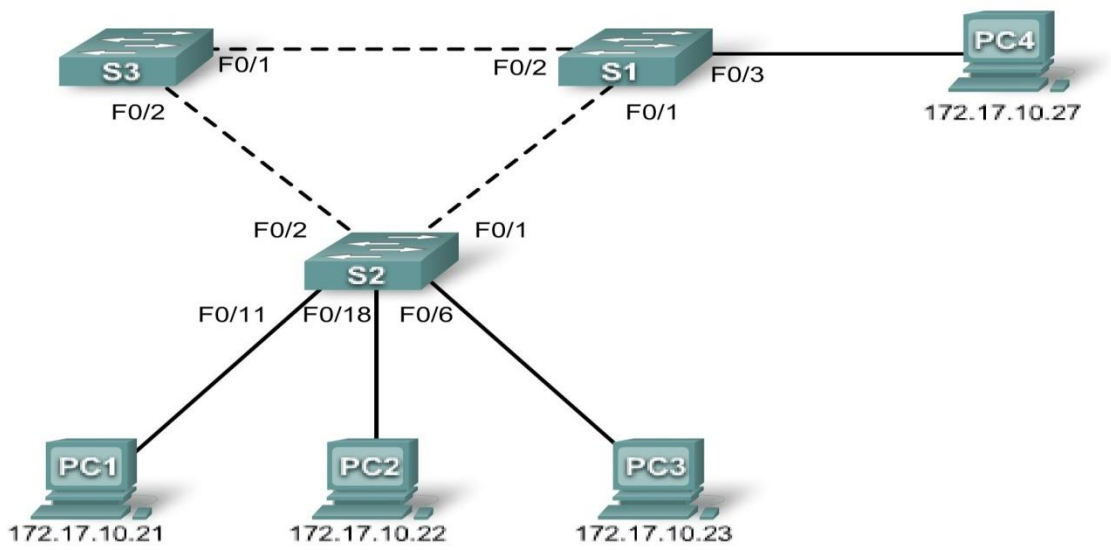
Objectives

Upon completion of this lab, you will be able to:

- Cable a network according to the topology diagram
- Erase the startup configuration and vlan.dat files and reload switches to the default state
- Load the switches with supplied scripts
- Find and correct all configuration errors
- Document the corrected network

Lab IX: Basic Spanning Tree Protocol

Topology Diagram



Addressing Table

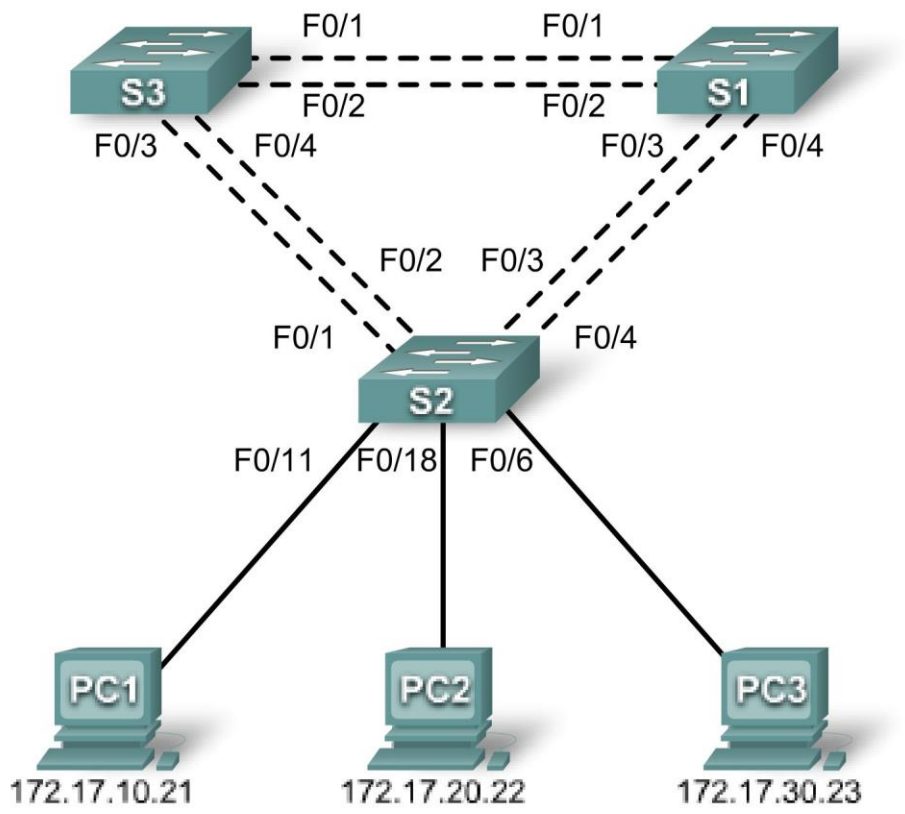
Device (Hostname)	Interface	IP Address	Subnet Mask	Default Gateway
S1	**VLAN 1**	172.17.10.1	255.255.255.0	N/A
S2	**VLAN 1**	172.17.10.2	255.255.255.0	N/A
S3	**VLAN 1**	172.17.10.3	255.255.255.0	N/A
PC1	**NIC**	172.17.10.21	255.255.255.0	172.17.10.254
PC2	**NIC**	172.17.10.22	255.255.255.0	172.17.10.254
PC3	**NIC**	172.17.10.23	255.255.255.0	172.17.10.254
PC4	**NIC**	172.17.10.27	255.255.255.0	172.17.10.254

Learning Objectives

- Cable a network according to the topology diagram
- Erase the startup configuration and reload the default configuration, setting a switch to the default state
- Perform basic configuration tasks on a switch
- Observe and explain the default behavior of Spanning Tree Protocol (STP, 802.1D)
- Observe the response to a change in the spanning tree topology

Lab X: Troubleshooting Spanning Tree Protocol

Topology Diagram



Addressing Table

Device (Hostname)	Interface	IP Address	Subnet Mask	Default Gateway
S1	**VLAN 99**	172.17.99.11	255.255.255.0	N/A
S2	**VLAN 99**	172.17.99.12	255.255.255.0	N/A
S3	**VLAN 99**	172.17.99.13	255.255.255.0	N/A
PC1	**NIC**	172.17.10.21	255.255.255.0	172.17.10.1
PC2	**NIC**	172.17.20.22	255.255.255.0	172.17.20.1
PC3	**NIC**	172.17.30.23	255.255.255.0	172.17.30.1

Port Assignments – Switch 2

Ports	Assignment	Network
Fa0/1 – 0/4	802.1q Trunks (Native VLAN 99)	172.17.99.0 /24
Fa0/5 – 0/10	VLAN 30 – Guest (Default)	172.17.30.0 /24
Fa0/11 – 0/17	VLAN 10 – Faculty/Staff	172.17.10.0 /24
Fa0/18 – 0/24	VLAN 20 – Students	172.17.20.0 /24

Learning Objectives

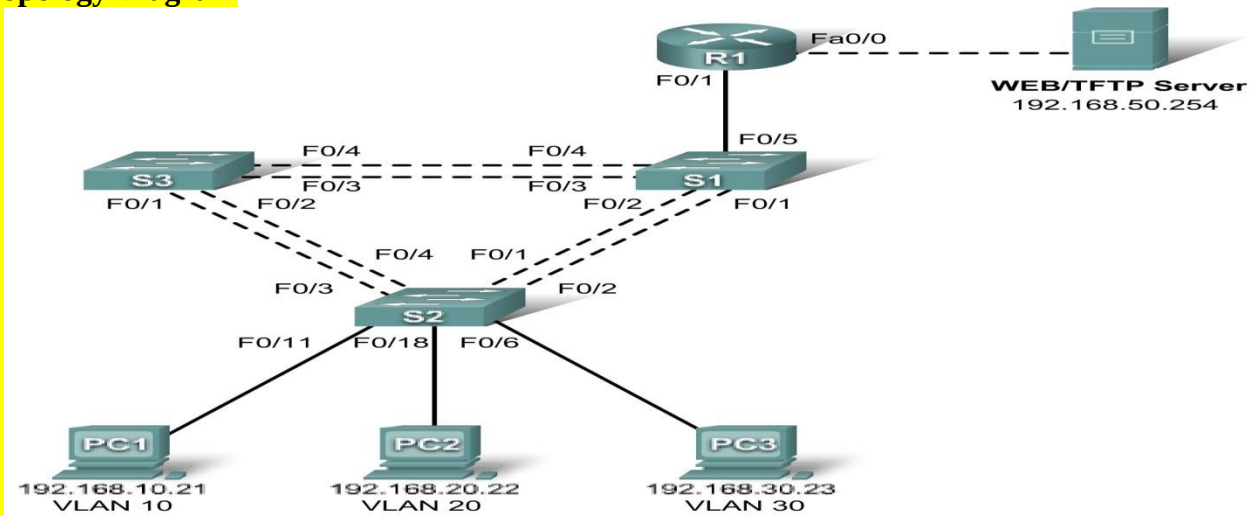
- Analyze a congestion problem in a redundant, switched LAN network.
- Recognize the capabilities for per-VLAN load balancing with PVST.

- Modify the default STP configuration to optimize available bandwidth.
- Verify that modifications have had the intended effect.

You are responsible for the operation of the redundant switched LAN shown in the topology diagram. You and your users have been observing increased latency during peak usage times, and your analysis points to congested trunks. You recognize that of the six trunks configured, only two are forwarding packets in the default STP configuration currently running. The solution to this problem requires more effective use of the available trunks. The PVST+ feature of Cisco switches provides the required flexibility to distribute the inter-switch traffic using all six trunks. This lab is complete when all wired trunks are carrying traffic, and all three switches are participating in per-VLAN load balancing for the three user VLANs.

Lab XI: Inter-VLAN Routing

Topology Diagram



Addressing Table

Device (Hostname)	Interface	IP Address	Subnet Mask	Default Gateway
S1	**VLAN 99**	192.168.99.11	255.255.255.0	192.168.99.1
S2	**VLAN 99**	192.168.99.12	255.255.255.0	192.168.99.1
S3	**VLAN 99**	192.168.99.13	255.255.255.0	192.168.99.1
R1	**Fa 0/0**	192.168.50.1	255.255.255.0	N/A
R1	**Fa 0/1**	See Subinterface Configuration Table		N/A
PC1	**NIC**	192.168.10.21	255.255.255.0	192.168.10.1
PC2	**NIC**	192.168.20.22	255.255.255.0	192.168.20.1
PC3	**NIC**	192.168.30.23	255.255.255.0	192.168.30.1
Server	**NIC**	192.168.50.254	255.255.255.0	192.168.50.1

Port Assignments – Switch 2

Ports	Assignment	Network
Fa0/1 – 0/5	802.1q Trunks (Native VLAN 99)	192.168.99.0 /24
Fa0/6 – 0/10	VLAN 30 – Sales	192.168.30.0 /24
Fa0/11 – 0/17	VLAN 10 – R&D	192.168.10.0 /24
Fa0/18 – 0/24	VLAN 20 – Engineering	192.168.20.0 /24

Subinterface Configuration Table – Router 1

Router Interface	Assignment	IP Address
Fa0/1.1	VLAN1	192.168.1.1
Fa0/1.10	VLAN 10	192.168.10.1
Fa0/1.20	VLAN 20	192.168.20.1
Fa0/1.30	VLAN 30	192.168.30.1
Fa0/1.99	VLAN 99	192.168.99.1

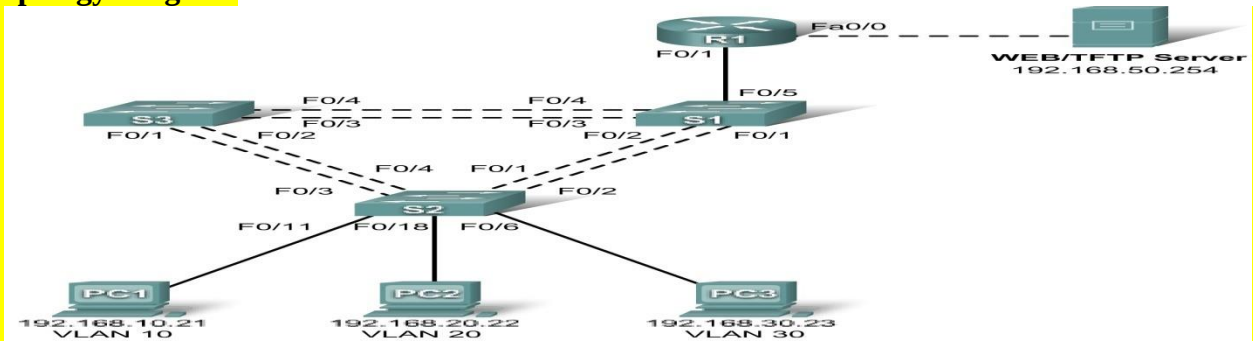
Learning Objectives

Upon completion of this lab, you will be able to:

- Cable a network according to the topology diagram
- Clear configurations and reload a switch and a router to the default state
- Perform basic configuration tasks on a switched LAN and a router
- Configure VLANs and VLAN Trunking Protocol (VTP) on all switches
- Configure a router to support 802.1q trunking on a Fast Ethernet interface
- Configure a router with subinterfaces corresponding to the configured VLANs

Lab XII: Troubleshooting Inter-VLAN Routing

Topology Diagram



Addressing Table

Device (Hostname)	Interface	IP Address	Subnet Mask	Default Gateway
S1	**VLAN 99**	192.168.99.11	255.255.255.0	192.168.99.1
S2	**VLAN 99**	192.168.99.12	255.255.255.0	192.168.99.1
S3	**VLAN 99**	192.168.99.13	255.255.255.0	192.168.99.1
R1	**Fa 0/0**	192.168.50.1	255.255.255.0	N/A
R1	**Fa 0/1**	See Subinterface Configuration Table		N/A
PC1	**NIC**	192.168.10.21	255.255.255.0	192.168.10.1
PC2	**NIC**	192.168.20.22	255.255.255.0	192.168.20.1
PC3	**NIC**	192.168.30.23	255.255.255.0	192.168.30.1
Server	**NIC**	192.168.50.254	255.255.255.0	192.168.50.1

Port Assignments – Switch 2

Ports	Assignment	Network
Fa0/1 – 0/5	802.1q Trunks (Native VLAN 99)	192.168.99.0 /24
Fa0/6 – 0/10	VLAN 30 – Sales	192.168.30.0 /24
Fa0/11 – 0/17	VLAN 10 – R&D	192.168.10.0 /24
Fa0/18 – 0/24	VLAN 20 – Engineering	192.168.20.0 /24

Subinterface Configuration Table – Router 1

Router Interface	Assignment	IP Address
Fa0/1.1	VLAN1	192.168.1.1
Fa0/1.10	VLAN 10	192.168.10.1
Fa0/1.20	VLAN 20	192.168.20.1
Fa0/1.30	VLAN 30	192.168.30.1
Fa0/1.99	VLAN 99	192.168.99.1

Learning Objectives

To complete this lab:

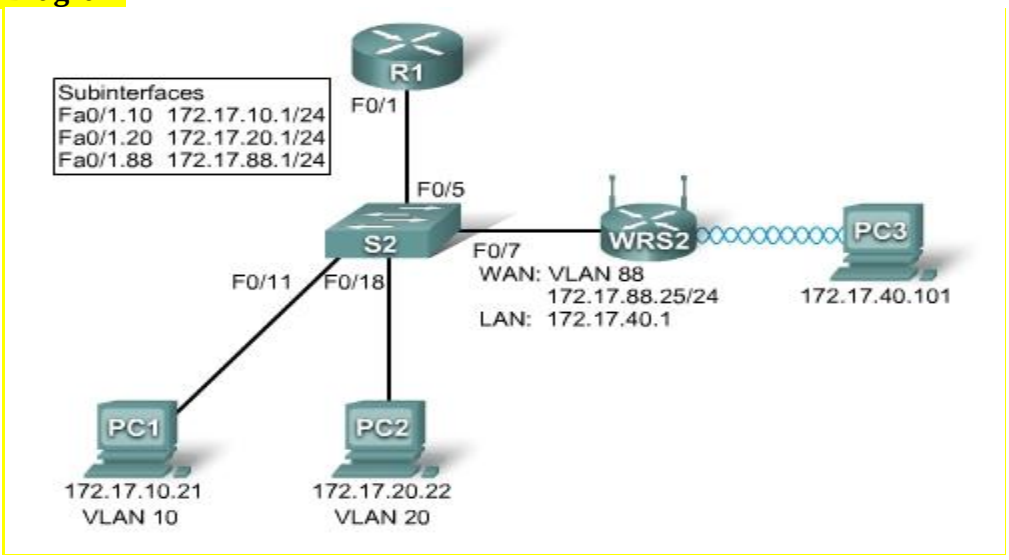
- Cable a network according to the topology diagram
- Erase any existing configurations and reload switches and the router to the default state
- Load the switches and the router with supplied scripts
- Find and correct all configuration errors
- Document the corrected network

Scenario

The network has been designed and configured to support five VLANs and a separate server network. Inter-VLAN routing is being provided by an external router in a router-on-a-stick configuration, and the server network is routed across a separate Fast Ethernet interface. However, it is not working as designed, and complaints from your users have not given much insight into the source of the problems. You must first define what is not working as expected, and then analyze the existing configurations to determine and correct the source of the problems. This lab is complete when you can demonstrate IP connectivity between each of the user VLANs and the external server network, and between the switch management VLAN and the server network.

Lab XIII: Basic Wireless Configuration

Topology Diagram

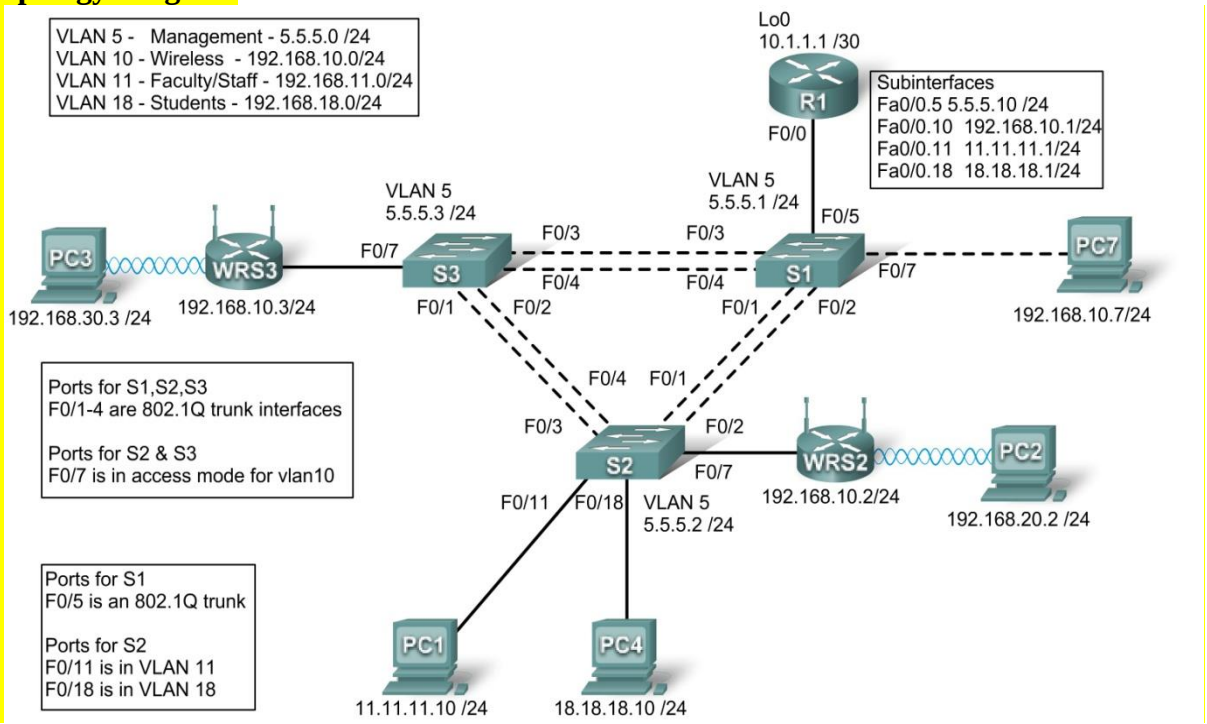


Learning Objectives

- Configure options in the Linksys Setup tab.
- Configure options in the Linksys Wireless tab.
- Configure options in the Linksys Administration tab.
- Configure options in the Linksys Security tab.
- Add wireless connectivity to a PC.
- Test connectivity.

Lab XIV: Troubleshooting Wireless Configuration

Topology Diagram



Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	Fa0/0.5	5.5.5.10	255.255.255.0	N/A
	Fa0/0.10	192.168.10.1	255.255.255.0	N/A
	Fa0/0.11	11.11.11.1	255.255.255.0	N/A
	Fa0/0.18	18.18.18.1	255.255.255.0	N/A
	Lo0	10.1.1.1	255.255.255.252	N/A
WRS2	WAN	192.168.10.2	255.255.255.0	192.168.10.1
	LAN/Wireless	192.168.20.1	255.255.255.0	N/A
WRS3	WAN	192.168.10.3	255.255.255.0	192.168.10.1
	LAN/Wireless	192.168.30.1	255.255.255.0	N/A
PC1	NIC	11.11.11.10	255.255.255.0	11.11.11.1
PC4	NIC	18.18.18.10	255.255.255.0	18.18.18.1
S1	VLAN 5	5.5.5.1	255.255.255.0	N/A
S2	VLAN 5	5.5.5.2	255.255.255.0	N/A
S3	VLAN 5	5.5.5.3	255.255.255.0	N/A

Scenario

In this lab, a basic network and wireless network have been configured improperly. You must find and correct the misconfigurations based on the minimum network specifications provided by your company.

Here are the configurations to load into your router and switches.

R1 Configuration

```
hostname R1
!
interface Loopback0
 ip address 10.1.1.1 255.255.255.0
!
interface FastEthernet0/0
 no ip address
 duplex auto
 speed auto
 no shutdown
!
interface FastEthernet0/0.5
 encapsulation dot1Q 5
 ip address 5.5.5.10 255.255.255.0
!
interface FastEthernet0/0.10
 encapsulation dot1Q 10
 ip address 192.168.11.1 255.255.255.0
!
!
interface FastEthernet0/0.18
 encapsulation dot1Q 18
 ip address 18.18.18.1 255.255.255.0
!
ip route 192.168.20.0 255.255.255.0 192.168.10.2
ip route 192.168.30.0 255.255.255.0 192.168.10.3
!
line con 0
 exec-timeout 0 0
 logging synchronous
!
end
```

Switch 1 Configuration

```
hostname S1
!
vtp mode transparent
!
```

```
vlan 5,10-11
!
interface FastEthernet0/1
 switchport trunk allowed vlan 5,10,11
 switchport mode trunk
 switchport trunk native vlan 5
!
interface FastEthernet0/2
 switchport trunk allowed vlan 5,10,11
 switchport mode trunk
 switchport trunk native vlan 5
!
interface FastEthernet0/3
 switchport trunk allowed vlan 5,10,11
 switchport mode trunk
 switchport trunk native vlan 5
!
interface FastEthernet0/4
 switchport trunk allowed vlan 5,10,11
 switchport mode trunk
 switchport trunk native vlan 5
!
interface FastEthernet0/5
 switchport mode trunk
 switchport trunk native vlan 5
!
interface Vlan5
 ip address 5.5.5.1 255.255.255.0
 no shutdown
!
line con 0
 exec-timeout 0 0
 logging synchronous
!
End
```

Switch 2 Configuration

```
hostname S2
!
vtp mode transparent
ip subnet-zero
!
vlan 5,10-11,18
!
```

```
interface FastEthernet0/1
 switchport trunk allowed vlan 5,10,11,18
 switchport mode access
!
interface FastEthernet0/2
 switchport trunk allowed vlan 5,10,11,18
 switchport mode access
!
interface FastEthernet0/3
 switchport trunk allowed vlan 5,10,11,18
 switchport mode access
!
interface FastEthernet0/4
 switchport trunk allowed vlan 5,10,11,18
 switchport mode access
!
interface FastEthernet0/7
 switchport access vlan 10
!
interface FastEthernet0/11
 switchport access vlan 11
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky 0336.5b1e.33fa
!
interface FastEthernet0/18
 switchport access vlan 18
 switchport mode access
 switchport port-security
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky 022c.ab13.22fb
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan5
 ip address 5.5.5.2 255.255.255.0
 no shutdown
!
line con 0
 exec-timeout 0 0
 logging synchronous
!
End
```

Switch 3 Configuration

```
hostname S3
!
vtp mode transparent
!
vlan 5,10-11,18
!
interface FastEthernet0/1
 switchport trunk allowed vlan 5,10,11,18
 switchport mode trunk
 switchport trunk native vlan 5
!
interface FastEthernet0/2
 switchport trunk allowed vlan 5,10,11,18
 switchport mode trunk
 switchport trunk native vlan 5
!
interface FastEthernet0/3
 switchport trunk allowed vlan 5,10,11,18
 switchport mode trunk
 switchport trunk native vlan 5
!
interface FastEthernet0/4
 switchport trunk allowed vlan 5,10,11,18
 switchport mode trunk
 switchport trunk native vlan 5
!
interface FastEthernet0/7
!
interface Vlan1
 no ip address
 no ip route-cache
!
interface Vlan5
 ip address 6.6.6.3 255.255.255.0
no shutdown
!
line con 0
 exec-timeout 0 0
 logging synchronous
!
end
```

Wireless Router Network Requirements

While troubleshooting WRS2 and WRS3, ensure that at least the following capabilities exist:

1. Connections via the IP addresses shown in the topology diagram.
2. More than 30 clients can get an IP address through DHCP at a single time.
3. A client can have a DHCP address for at least 2 hours.
4. Clients using both B and G wireless network modes can connect, but N clients cannot.
5. Wireless clients must be authenticated using WEP with a key of 5655545251.
6. Traffic between PC2 and PC3 must take the most efficient route possible.
7. Ping requests coming from outside WAN ports of the Linksys routers to their inside LAN/wireless IP addresses (192.168.30.1) must be successful.
8. DHCP must not give out IP addresses in a range that includes the addresses for PC2 and PC3.
9. The two wireless networks must not interfere with each other.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

PYTHON LAB

Course Code	L	T	P/FW	CREDITS	Semester
MCA347	-	-	2	1	III

Course Learning Outcomes:

1.Read and understand Python-based software code of medium-to-high complexity.

2. Use standard and different type of Python's libraries when required for implementation.

3. Understand the basic principles of creating Python applications or program.

4. Understand the fundamental concepts of computer science: structure of the computational process, algorithms and complexity of computation.

Course Content:

1. Installing Python and configuring environment.
2. To display and find the size of all data types in Python.
3. To show the use of loops
4. To work with different operators including lazy operators.
5. Working with strings operations.
6. Writing and reading to/from a file.
7. To perform operations on list.
8. To perform operations on tuple.
9. To perform operations on dictionary.
10. Working with functions including recursive ones.
11. To perform manipulation with image files.
12. To perform operations on images using turtle module.
13. To show OOP features in Python like encapsulation, inheritance etc.

BIG DATA AND ANALYTICS USING R LAB

Course Code	L	T	P	Credit	Semester
MCA348	-	-	2	1	III

Course Learning Outcomes:

What is the major objective of big data?
Big data analytics helps organizations harness their data and use it to identify new opportunities. That, in turn, leads to smarter business moves, more efficient operations, higher profits and happier customers.

Lab Exercises:

1. (i)Perform setting up and Installing Hadoop in its two operating modes:
   - Pseudo distributed,
   - Fully distributed.

   (ii) Use web based tools to monitor your Hadoop setup.

2. (i) Implement the following file management tasks in Hadoop:
   - Adding files and directories
   - Retrieving files
   - Deleting files

   ii) Benchmark and stress test an Apache Hadoop cluster

3. Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm.
   - Find the number of occurrence of each word appearing in the input file(s)
   - Performing a MapReduce Job for word search count (look for specific keywords in a file)

4. Stop word elimination problem:
   Input: A large textual file containing one sentence per line
   A small file containing a set of stop words (One stop word per line)
   Output: A textual file containing the same sentences of the large input file without the words appearing in the small file.

5. Write a Map Reduce program that mines weather data. Weather sensors collecting data every hour at many locations across the globe gather large volume of log data, which is a good candidate for analysis with MapReduce, since it is semi structured and record-oriented.
   Data available at: https://github.com/tomwhite/hadoopbook/tree/master/input/ncdc/all .
   Find average, max and min temperature for each year in NCDC data set.

6. Purchases.txt Dataset
   - Instead of breaking the sales down by store, give us a sales breakdown by• product category across all of our stores
     - What is the value of total sales for the following categories?

        - Toys
        - Consumer Electronics
    - Find the monetary value for the highest individual sale for each separate store
        - What are the values for the following stores?
            - Reno
            - Toledo
            - Chandler

Find the total sales value across all the stores, and the total number of sales.

7. Install and Run Pig then write Pig Latin scripts to sort, group, join, project, and filter your data.

8. Write a Pig Latin scripts for finding TF-IDF value for book dataset (A corpus of eBooks available at: Project Gutenberg)
9. Install and Run Hive then use Hive to create, alter, and drop databases, tables, views, functions, and indexes.

10. Install, Deploy & configure Apache Spark Cluster. Run apache spark applications using Scala.

11. Data analytics using Apache Spark on Amazon food dataset, find all the pairs of items frequently reviewed together.
    - Write a single Spark application that:
        - Transposes the original Amazon food dataset, obtaining a PairRDD of the type: →
        - Counts the frequencies of all the pairs of products reviewed together;
        - Writes on the output folder all the pairs of products that appear more than once and their frequencies. The pairs of products must be sorted by frequency.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ANDROID PROGRAMMING LAB

Course Code	L	T	P	Credit	Semester
MCA349	-	-	2	1	III

Course Learning Outcomes:

Install and configure Android application development tools.
Design and develop user Interfaces for the Android platform.
Save state information across important operating system events.
Apply Java programming concepts to Android application development.

The experiments will be based on the topics covered in the corresponding theory Course.

1. Write a Program to Build a Simple Android Application
2. Java Andorid Program to Demonstrate Usage of String.xml File
3. Java Andorid Program to Demonstrate Activity Life Cycle
4. Write a Program to Change the Background of your Activity
5. Java Andorid Program to Perform all Operations using Calculators
6. Write a Program to Change the Image Displayed on the Screen
7. Write a Program to Create Multiple Activities within an Application
8. Write a Program to Demonstrate Action Button by Implementing on Click Listener
9. Write a Program to Demonstrate the Sound Button Application
10. Write a Program to Demonstrate the use of Scroll View
11. Write a Program to Demonstrate Radio Group Application
12. Write a Program to Demonstrate Alert Dialog Box
13. Write a Program to Set the Wallpaper of Your Device using Bitmap Class
14. Write a Program to Demonstrate the Menu Application
15. Write a Program to Demonstrate Toast in an Application
16. Write a Program for Dividing our Activity into Fully Encapsulated Reusable Components using Fragement
17. Write a Program to Demonstrate List View Activity
18. Write a Program to Demonstrate an Advanced Xml Layout
19. Write a Program to Draw on a Canvas
20. Write a Program to Demonstrate Surface View via Thread
21. Write a Program to Demonstrate Count Down Timer Application
22. Write a Program to Demonstrate Tip Calculator
23. Write a Program to Animate Bitmap
24. Write a Program to Demonstrate Layouts in an Activity and Nesting of Layouts
25. Write a Program to Demonstrate Touch Listener
26. Write a Program to Demonstrate Motion Event on Android screen with the help of an Image
27. Write a Program to Draw a Spritesheet on a Canvas
28. Write a Program to Demonstrate an Advanced Animation Activity
29. Write a Program to Demonstrate a Simple Video View
30. Write a Program to Demonstrate Simple Animation Activity
31. Write a Program to Demonstrate a Simple to do List Application
32. Write a Program to Demonstrate an Adapter
33. Write a Program to demonstrate Advanced Adapter

34. Write a Program to Demonstrate a Simple Compound Control
35. Write a Program to Demonstrate Explicit Intent
36. Write a Program to Demonstrate Implicit Intent
37. Java Andorid Program to Demonstrate Linkify Class in Android
38. Java Andorid Program to Demonstrate a Match Filter
39. Write a Program to Demonstrate a TransformFilter
40. Write a Program to Demonstrate Broadcast Receiver
41. Write a Program to Demonstrate BroadCast Receiver to Intercept Custom Intent
42. Write a Program to Demonstrate Pending Intent
43. Write a Program to Demonstrate Ordered BroadCast
44. Write a Program to Demonstrate Intent Filter
45. Write a Program to Demonstrate Local BroadCast Manager
46. Write a Program to Monitoring Device State Changes Using Broadcast Intents
47. Write a Program to Open an Internet Data Stream
48. Write a Program to Parse Xml Using Xml Pull Parser
49. Write a Program to Parse Xml Using Dom Parser
50. Write a to demonstrate Download Manager in Android
51. Write a Program to Demonstrate Connection to an Internet Resource
52. Write a Program to Demonstrate Google Maps in Andorid
53. Write a Program to Demonstrate Zoom-IN and Zoom -Out of an image using Touch events
54. Write a Program to Demonstrate Creating and Saving Shared Preferences
55. Write a Program to Demonstrate Preference Screen
56. Write a Program to Demonstrate Subscreen in a Prefernce Screen
57. Write a Program to Demonstrate Intent in Preference Screen
58. Write a Program to Demonstrate Prefernce Fragement
59. Write a Program to Demonstrate Preference Headers
60. Write a Program to Demonstrate Preferenece Activity
61. Write a Program to Demonstrate Reading a File on SD Card
62. Write a Program to Demonstrate Reading and Writing to a File in Android
63. Write a Program to Demonstrate Instance Save State
64. Write a Program to Write to a SQLite Database in Android
65. Write a Program to Read and Write to a SQLite Database in Android
66. Write a Program to Read Write and Delete to a SQLite Database in Android
67. Write a Program to Demonstrate Content Providers in Android
68. Write a Program to Create Grade Report Using Content Providers in Android
69. Write a Program to Create Search Activity for an Application in Andorid
70. Write a Program to Demonstrate Search Interface in Android
71. Write a Program to Demonstrate Search Interface with Suggestion Provider in Android
72. Write a Program to Demonstrate Voice Search in a Search Provider
73. Write a Program to Demonstrate a Full Screen Activity
74. Write a Program to Change an Activity's Icon
75. Write a Program to Set an Activity in Potrait Mode
76. Write a Program to Set an Activity in Landscape Mode
77. Write a Program to Demonstrate Media Content Provider
78. Write a Program to Access the Contacts Contract Contact Content Provider
79. Write a Program to Demonstrate Finding contact details for a contact name
80. Write a Program to Demonstrate Performing a Caller-ID lookup
81. Write a Program to Pick Contacts Using Intent
82. Write a Program to Create New Contact Using Intent
83. Write a Program to Demonstrate Calendar Content Provider
84. Write a Program to Demonstrate to Insert a New Calendar Event Using Intent

85. Write a Program to Edit a Calendar Event Using Intent
86. Write a Program to Display a calendar event using an Intent
87. Write a Program to Demonstrate Deleting a Calendar Event in Android
88. Write a Program to Start a Service in Android
89. Write a Program to Start a Service to Vibrate Phone
90. Write a Program to Start and Stop a Service in Android
91. Write a Program to Demonstrate to Force Stop a Service in Android
92. Write a Program to Demonstrate Self Terminating Services
93. Write a Program to Start a Service in a Different Process
94. Write a Program to Create a New Thread for Service Tasks
95. Write a Program to Start a Starting Services regularly via AlarmManager in Android
96. Write a Program to Cancel an Alarm Intent
97. Java Andorid Program to Start a Service After Every Hour
98. Write a Program to Demonstrate IntentServices in Android
99. Write a Program to Demonstrate Dowloading a File Using a Service
100. Write a Program to Demonstrate Binding a Service to an Activity
101. Write a Program to Move a Service to Background in Android
102. Write a Program to Demonstrate Asynchronous Tasks in Android
103. Write a Program to Demonstrate Loaders in Android
104. Write a Program to Demonstrate Action Bar in Android
105. Write a Program to Disable the Action Bar in an Activity in Android
106. Write a Program to Hide Title Label of Action Bar in Android
107. Write a to Add Actions in Action Bar in Android
108. Write a Program to Respond to Added Actions in Action Bar in Android
109. Write a Program to Change the Displayed Text alongside the Application Icon at Runtime
110. Write a Program to Change the Background of Action Bar in Android
111. Write a Program to Dim the Software Navigation Button in your Android Application
112. Write a Program to add Action to Home Icon
113. Write a Program to add Action to Home Icon using set the parentActivityName
114. Write a Program to Enable the Split Action Bar
115. Write a Program to Add a Custom View to the ActionBar
116. Write a Program to Demonstrate Action View in Android
117. Write a Program to Demonstrate Share Action Provider in Android
118. Write a Program to Demonstrate Navigation Drawer in Android
119. Write a Program to Demonstrate Navigation Using Fragments in Android
120. Write a Program to Demonstrate adding actions to Navigation Bar in Android
121. Write a Program to Demonstrate Navigation Drawer with Different Fragements in Android
122. Write a Program to Demonstrate Tab Navigation in Android
123. Write a Program to Demonstrate Drop Down Navigaton in Android
124. Write a Program to Demonstrate Contextual Mode in Android
125. Write a Program to Show SMS in Your Phone
126. Write a Program to Display SMS from the Phone Numbers, which are in Your Contacts
127. Write a Programs to Know Your Current Location Using GPS
128. Write a Program to Calculate Distance between two points using Latitude & Longitude
129. Write a that Accepts a Location from the User, Run in the Background, and Notifies the User when he/she is within 1Km from that Location
130. Write a Program to Shows SMS from the phone numbers, which are in your contacts
131. Write a Program to Show Contacts in Your Phone

132. Write a Program to Demonstrate to Receive BroadCast in Android
133. Write a Program to Consume GPS Broad-Cast using BroadCast Receiver
134. Write a Program to Define a Style and Apply to a View
135. Write a Program to Create a Text View with Rounded Corners
136. Write a Program to Demonstrate Button with Rounded Corners
137. Write a Program to Send Message From Service to Activity
138. Write a Program to Send Data From Service to Activity in Android
139. Write a Program to Draw Driving Route on Google Maps in Android
140. Write a Program to Demonstrate Grid View Layout in Android
141. Write a Program to Demonstrate Custom Grid View Layout in Android
142. Write a Program to Customize GridView Style in Android
143. Write a Program to Demonstrate Geo Coding in Android
144. Write a Program to Get more than one Geo location of a Place
145. Write a Program to Create Simple Menu in Android
146. Write a Program to Demonstrate Creating an Options Menu in Android
147. Write a Program to Demonstrate Context Menu in Android
148. Write a Program to Demonstrate Popup Menu in Android
149. Write a Program to Demonstarte Menu Groups in Android
150. Write a Program to Demonstrate Checkable Menu Items in Android
151. Write a Program to Demonstrate Adding Menu Items Based on an Intent in Android
152. Write a Program to Demonstrate Adding a Share Action Provider to a Menu in Android
153. Write a Program to Demonstrate Defining Menu Hierarchies in XML in Android
154. Write a Program to Demonstrate Adding Shortcuts to Items in a Menu in Android
155. Write a Program to Demonstrate Date Picker Dialog in Android
156. Write a Program to Demonstrate Character Picker Dialog in Android
157. Write a Program to Demonstrate Time Picker Dialog in Android
158. Write a Program to Demonstrate Progress Dialog in Android
159. Write a Program to Demonstrate Progress Dialog with Spinning Wheel in Android
160. Write a Program to Demonstrate Parsing a Json Object
161. Write a Program to Demonstrate Custom Toast in Android
162. Write a Program to Display Custom Toast in the Center of Screen
163. Write a Program to Demonstrate Shape Drawables
164. Write a Program to Demonstrate Gradient Drawables
165. Write a Program to Demonstrate Radial Gradient in Android
166. Write a Program to Demonstrate Sweep Gradient in Android
167. Write a Program to Demonstrate Text to Speech in Android
168. Write a Program to Play Sound Using Sound Pool
169. Write a to Record Media Using Media Recorder
170. Write a Program to Send and Receive Data From Server

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

MINOR PROJECT

Course Code	L	T	P	Credit	Semester
MCA 350	-	-	-	6	III

Course Learning Outcomes:

CO1. Identify the proposed problem
CO2. Develop a functional application based on the software design
CO3. Apply to code, debugging, and testing tools for implementation
CO4. Prepare the proper documentation for report writing and oral presentation.

GUIDELINES FOR PROJECT FILE

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation.

Research is genuine exploration of the unknown that leads to new knowledge, which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals.
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

Report Layout

The report should contain the following components

1. File should be in the following specification

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components

Front Page

Table of Contents
Acknowledgement
Student Certificate
Company Profile
Introduction
Chapters
Appendices
References / Bibliography

- **Title or Cover Page or Front Page**

The title page should contain the following information: Project Title; Student's Name; Course; Year; Supervisor's Name.

➢ **Table of Contents**

Titles and subtitles are to correspond exactly with those in the text.

➢ **Acknowledgement**

Acknowledgment to any advisory or financial assistance received in the course of work may be given.

➢ **Student Certificate**

Given by the Institute.

➢ **Company Certificate & Profile**

This is a certificate, which the company gives to the students. A Company Profile corresponds to a file with company-specific data. Company data can be stored there and included in a booking when needed.

➢ **Introduction**

Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

➢ **Chapters**

All chapters and sections must be appropriately numbered, titled and should neither be too long nor too short in length.

The first chapter should be introductory in nature and should outline the background of the project, the problem being solved, the importance, other related works and literature survey. The other chapters would form the body of the report. The last chapter should be concluding in nature and should also discuss the future prospect of the project.

➢ **Appendices**

The Appendix contains material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

➢ **References / Bibliography**

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project. Project execution is concerned with assessing how much work has been put in.

The File should fulfill the following ***assessment objectives:***

1. Writing a critical literature review

- Search for literature
- Summarizing and presenting the literature
- Evaluating key content and theories

2. Collecting and analyzing research material

- Choosing and designing research method
- Conducting the research
- Analyzing, sorting and classifying the data to make decision

1. Interpreting research method and draw conclusion

- Findings
- Recommendation

2. Assigning the theories and writing the project report

- Structuring the project in accordance with the given style

3. Bibliography

- This refer to the books, Journals and other documents consulting while working on the project

Examination Scheme:

Components	**MRP**	**V**	**S**	**FP**	**R**
Weightage (%)	20	20	20	20	20

MRP – Mid Report Presentation, V – Viva, S – Synopsis, FP – Final Presentation, R - Report

REPORT ON PAPER PRESENTATION IN CONFERENCE

Course Code	L	T	P	Credit	Semester
MCA 351	-	-	-	1	III

Course Learning Outcomes:

CO1. Ability to be a multi-skilled with sound technical knowledge.
CO2. Ability to communicate efficiently.
CO3. Develop technical report writing and oral presentati
on skills
CO4. Prepare the proper documentation forreport writing and oral presentation.

Rules and Regulations

- 2nd Year / 3rd Year Students for which the students and the faculty members can start preparations well in advance prior to the scheduled conference / seminar / workshop.
- The number of students going for any conference / seminar / workshop should be manageable.
- A proposal for the proposed conference / seminar / workshop should be drafted and presented to the HoI reflecting the following key points:
    - Entire activity plan
    - Route Map
    - What are the objectives for the students?
    - What they need to learn, do, and prepare before the conference / seminar / workshop?
    - List of prospective students with Contact Details
    - List of Faculty Coordinators with Contact Details
- After getting approval from the HoI, a note sheet should be prepared and all necessary permission and approval from the competent authorities should be obtained.
- The attention and co-operation of all students and parents are requested to attend the conference / seminar / workshop most effectively. Signing of the letter of Indemnity Bond (Consent-cum-Undertaking) is mandatory for all the parents of students going for conference / seminar / workshop in or outside Jaipur. Duly executed Indemnity Bond should be submitted to HoI Office at least 2 days prior to the visit, without which the accompanying Staff coordinator shall not permit the student to participate in the industrial visit
- The list of students participating in conference / seminar / workshop shall be handed over to the concerned HODs, Staff coordinators.
- Students should be present in formals.
- Students should carry the College Identity Cards during their journey.
- Discipline should be maintained during the conference / seminar / workshop. Any violation will be viewed very seriously.
- A report of the conference / seminar / workshop is to be submitted in 5 days time by students / faculty coordinators once the students are back.

The report to be prepared should reflect the following:-

- What happened at the conference / seminar / workshop the students attend and how does it relate in the best way to the preparations and the learning objectives.

- How do the students will use the outcome of conference / seminar / workshop after it is over?
- What will they gain from it and how can they set up activities that transfer the experience into learning?
- Evaluation parameters for the success of the experience of conference / seminar / workshop.

The layout guidelines for the Report:

1. File should be in the following specification:

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components:

- Front Page
- Table of Content
- Acknowledgement
- Student Certificate
- Company Profile (optional)
- Introduction
- Main Body
- References / Bibliography

ASSESSMENT OF THE PAPER PRESENTATION FILE

The student will be provided with the Student Assessment Record (SAR) to be placed in front of the Report File. Each item in the SAR is ticked off when it is completed successfully. The faculty will also assess each item as it is completed. The SAR will be signed by the student and by the faculty to indicate that the File is the student's own work. It will also ensure regularity and meeting the delaines.

Examination Scheme:

Components	**V**	**S**	**R**	**FP**
Weightage (%)	20	20	20	40

V – Viva, S – Synopsis, FP – Final Presentation, R - Report

SUMMER INTERNSHIP PROJECT

Course Code	L	T	P	Credit	Semester
MCA 352	-	-	-	3	III

Course Learning Outcomes:

CO1. Identify, Define and justify the scope of the proposed problem
CO3. Propose an optimized solution among the existing solutions
CO3. Apply to code, debugging, and testing tools for implementation
CO4. Prepare the proper documentation for report writing and oral presentation.

GUIDELINES:

There are certain phases of every Intern's professional development that cannot be effectively taught in the academic environment. These facets can only be learned through direct, on-the-job experience working with successful professionals and experts in the field. The internship program can best be described as an attempt to institutionalize efforts to bridge the gap between the professional world and the academic institutions. Entire effort in internship is in terms of extending the program of education and evaluation beyond the classroom of a university or institution. The educational process in the internship course seeks out and focuses attention on many latent attributes, which do not surface in the normal classroom situations. These attributes are intellectual ability, professional judgment and decision-making ability, inter-disciplinary approach, skills for data handling, ability in written and oral presentation, sense of responsibility etc.

In order to achieve these objectives, each student will maintain a file (**Internship File**). The Internship File aims to encourage students to keep a personal record of their learning and achievement throughout the Programme. It can be used as the basis for lifelong learning and for job applications. Items can be drawn from activities completed in the course modules and from the workplace to demonstrate learning and personal development.

The File will assess the student's analytical skills and ability to present supportive evidence, whilst demonstrating understanding of their organization, its needs and their own personal contribution to the organization.

The **layout guidelines** for the Project & Seminar Report

1. File should be in the following specification

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components
Front Page
Table of Content
Acknowledgement
Student Certificate
Company Profile (optional)
Introduction
Main Body
References / Bibliography

The File will include ***five sections*** in the order described below. The content and comprehensiveness of the main body and appendices of the report should include the following:

1. **The Title Page**--Title - An Internship Experience Report For (Your Name), name of internship organization, name of the Supervisor/Guide and his/her designation, date started and completed, and number of credits for which the report is submitted.
2. **Table of Content**--an outline of the contents by topics and subtopics with the page number and location of each section.
3. **Introduction**--short, but should include how and why you obtained the internship experience position and the relationship it has to your professional and career goals.
4. **Main Body**--should include but not be limited to daily tasks performed. Major projects contributed to, dates, hours on task, observations and feelings, meetings attended and their purposes, listing of tools and materials and their suppliers, and photographs if possible of projects, buildings and co-workers.
5. **References / Bibliography** --This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system

ASSESSMENT OF THE INTERNSHIP FILE

The student will be provided with the Student Assessment Record (SAR) to be placed in front of the Internship File. Each item in the SAR is ticked off when it is completed successfully. The faculty will also assess each item as it is completed. The SAR will be signed by the student and by the faculty to indicate that the File is the student's own work. It will also ensure regularity and meeting the delaines.

STUDENT ASSESSMENT RECORD (SAR)

1. Range of Research Methods used to obtain information

2. Execution of Research

3. Data Analysis
- Analyse Quantitative/ Qualitative information

- Control Quality

4. Draw Conclusions

Examination Scheme:

Components	V	S	R	FP
Weightage (%)	20	20	20	40

V – Viva, S – Synopsis, FP – Final Presentation, R - Report

Anandam-III

Course Code	L	T	P	Credit	Semester
AND003	-	-	-	2	III

Course Learning Outcomes :

1.Awareness and empathy regarding community issues
2.Interaction with the community and impact on society
3.Interaction with mentor and development of Student teacher relationship
4.Interaction among students, enlarge social network
5.Cooperative and Communication skills and leadership qualities
6.Critical thinking, Confidence and Efficiency

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants,phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.

- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

13. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
14. The group member shall write his/her name at the end of the blog.
15. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
16. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
17. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
18. For the topic chosen by the group, students are recommended to cover the following points:
    m) Current scenario (Regional, national and international level as applicable)
    n) Future predictions
    o) Duty of the government
    p) Government policies (related to the topic), if any
    q) Duty of public
    r) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

7. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
8. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
9. Conclusion is clearly stated. The underlying logic is explicit.

COMMUNICATION SKILLS - III

Course Code	L	T	P	Credit	Semester
BCS311	1	-	-	1	III

Course Learning Outcomes :

CLO 1 Develop an idea of professional work place

CLO 2 Learn about the importance of interviews, etiquette.

CLO 3 Learn the basic steps and techniques for preparing and for having a successful interview

CLO 4 Demonstrate Workplace Speaking Skills.

Course Contents:

Module I: Essentials of Workplace Conversation
Language: registers (formal vs. informal) and usage
Job description and evaluation;
Relations with superiors, peers, and subordinates
Team building
Conversation Management
Non Verbal Aids

Module II:Dynamics of Group Discussion
Introduction,
Methodology
Role Functions
Mannerism
Guidelines

Module III:Communication through Electronic Channels
Introduction
Technology based Communication Tools
Video Conferencing
Web Conferencing
Selection of the Effective Tool

E-mails, Fax etc.

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A
Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Jermy Comfort, Speaking Effectively, et.al, Cambridge
- Krishnaswamy, N, Creative English for Communication, Macmillan
- Raman Prakash, Business Communication, Oxford.
- Taylor, Conversation in Practice,

BEHAVIOURAL SCIENCE – III
(LEADING THROUGH TEAMS)

Course Code	L	T	P	Credit	Semester
BSS311	1	-	-	1	III

Course Learning Outcomes :

1. Describe team design features and the difference between team and group, and components of the concept.
2. Identify the patterns of interaction in a team, method of studying attractions and repulsions in groupssociometry and construction of socio-gram for studying interpersonal relations in a Team.
3. Analyze various stages of team growth, team performance curve profiling a team: Role of leadership in managing team.
4. Differentiate between management values, pragmatic spirituality in life and organization building global teams through universal human values.
5. Demonstrate the leaning of teams, leadership and values, pragmatic spirituality in life and organization building global teams.

Course Contents:

Module I: Individual differences& Personality

Personality: Definition& Relevance

Importance of nature & nurture in Personality Development

Importance and Recognition of Individual differences in Personality

Accepting and Managing Individual differences (Adjustment Mechanisms)

Module II: Socialization

Nature of Socialization

Social Interaction

Interaction of Socialization Process

Contributions to Society & Nation

Module III: Patriotism and National Pride

Sense of Pride and Patriotism

Importance of Discipline and hard work

Integrity and accountability

Module IV: Human Rights, Values and Ethics

Meaning of Human Rights

Human Rights Awareness

Importance of human rights

Values and Ethics

Module V: Workforce Diversity & Peace

Globalization and workforce

Gender Sensitization
Respect for diversity
Power of peace

Module VI:End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Examination Scheme:

Components	**SAP**	**A**	**Mid Term Test (CT)**	**VIVA**	**Journal for Success (JOS)**
Weightage (%)	20	05	20	30	25

Text & References:

- Bates, A. P. and Julian, J.: Sociology - Understanding Social Behaviour
- Dressler, David and Cans, Donald: The Study of Human Interaction
- Lapiere, Richard. T – Social Change
- Rose, G.: Oxford Textbook of Public Health, Vol.4, 1985.
- Robbins O.B. Stephen; Organizational Behaviour

(FOREIGN LANGUAGE)

FRENCH – III

Course Code	L	T	P	Credit	Semester
FLT311	2	-	-	2	III

Course Learning Outcomes:

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts .
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self introduction, family description etc

Course Contents:

Module D: pp. 131 – 156 Unités 10, 11

Contenu lexical: **Unité 10**: Prendre des décisions

1. Faire des comparaisons
2. décrire un lieu, le temps, les gens, l'ambiance
3. rédiger une carte postale

Unité 11: faire face aux problèmes

1. Exposer un problème.
2. parler de la santé, de la maladie
3. interdire/demander/donner une autorisation
4. connaître la vie politique française

Contenu grammatical:

1. comparatif - comparer des qualités/ quantités/actions
2. supposition: Si + présent, futur
3. adverbe - caractériser une action
4. pronom "Y"

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1

GERMAN - III

Course Code	L	T	P	Credit	Semester
FLG311	2	-	-	2	III

Course Learning Outcomes :

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts .
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self introduction, family description etc.

Course Contents:

Module I: Genitive case

Genitive case – Explain the concept of possession in genitive

Mentioning the structure of weak nouns

Module II: Genitive prepositions

Discuss the genitive propositions and their usage: (während, wegen, statt, trotz)

Module III: Reflexive verbs

Verbs with accusative case

Verbs with dative case

Difference in usage in the two cases

Module IV: Verbs with fixed prepositions

Verbs with accusative case

Verbs with dative case

Difference in the usage of the two cases

Module V: Texts

A poem 'Maxi'

A text Rocko

Module VI: Picture Description

Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;

Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch

- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH – III

Course Code	L	T	P	Credit	Semester
FLS 311	2	-	-	2	III

Course Learning Outcomes:

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts .
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self introduction, family description etc.

Course Contents:

Module I
Revision of earlier semester modules

Module II
Future Tense

Module III
Presentations in English on
Spanish speaking countries'
Culture
Sports
Food
People
Politics
Society
Geography

Module IV
Situations:
En el hospital
En la comisaria
En la estacion de autobus/tren
En el banco/cambio

Module V

General revision of Spanish language learnt so far.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español Sin Fronteras, Greenfield

CHINESE – III

Course Code	L	T	P	Credit	Semester
FLC 311	2	-	-	2	III

Course Learning Outcomes:

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts .
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.

Course Contents:

Module I

Drills
Dialogue practice
Observe picture and answer the question.
Pronunciation and intonation.
Character writing and stroke order

Module II

Intonation
Chinese foods and tastes – tofu, chowmian, noodle, Beijing duck, rice, sweet, sour….etc.
Learning to say phrases like – Chinese food, Western food, delicious, hot and spicy, sour, salty, tasteless, tender, nutritious, god for health, fish, shrimps, vegetables, cholesterol is not high, pizza, milk, vitamins, to be able to cook, to be used to, cook well, once a week, once a month, once a year, twice a week……
Repetition of the grammar and verbs taught in the previous module and making dialogues usingit.
Compliment of degree "de".

Module III

Grammar the complex sentence "suiran … danshi…."
Comparison – It is colder today than it was yesterday…..etc.
The Expression "chule….yiwai". (Besides)
Names of different animals.
Talking about Great Wall of China
Short stories

Module IV

Use of "huozhe" and "haishi"

Is he/she married?

Going for a film with a friend.

Having a meal at the restaurant and ordering a meal.

Module V

Shopping – Talking abut a thing you have bought, how much money you spent on it? How many kinds were there? What did you think of others?

Talking about a day in your life using compliment of degree "de". When you get up? When do you go for class? Do you sleep early or late? How is Chinese? Do you enjoy your life in the hostel?

Making up a dialogue by asking question on the year, month, day and the days of the week and answer them.

Examination Scheme:

Components	**CT1**	**CT2**	**C**	**I**	**V**	**A**
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- "Elementary Chinese Reader " Part-II Lesson 39-46

PROJECT WORK / INTERNSHIP/ DISSERTATION

Course Code	L	T	P	Credit	Semester
MCA460/461/462	-	-	-	30	IV

Course Learning Outcomes

CO1. Identify, Define and justify the scope of the proposed problem
CO3. Propose an optimized solution among the existing solutions
CO3. Apply to code, debugging, and testing tools for implementation
CO4. Prepare the proper documentation for report writing and oral presentation.

GUIDELINES FOR PROJECT FILE

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation.

Research is genuine exploration of the unknown that leads to new knowledge, which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals.
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

Report Layout

The report should contain the following components

1. File should be in the following specification

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components

Front Page
Table of Contents
Acknowledgement
Student Certificate
Company Profile
Introduction
Chapters
Appendices
References / Bibliography

- **Title or Cover Page or Front Page**

The title page should contain the following information: Project Title; Student's Name; Course; Year; Supervisor's Name.

➢ **Table of Contents**

Titles and subtitles are to correspond exactly with those in the text.

➢ **Acknowledgement**

Acknowledgment to any advisory or financial assistance received in the course of work may be given.

➢ **Student Certificate**

Given by the Institute.

➢ **Company Certificate & Profile**

This is a certificate, which the company gives to the students. A Company Profile corresponds to a file with company-specific data. Company data can be stored there and included in a booking when needed.

➢ **Introduction**

Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

➢ **Chapters**

All chapters and sections must be appropriately numbered, titled and should neither be too long nor too short in length.

The first chapter should be introductory in nature and should outline the background of the project, the problem being solved, the importance, other related works and literature survey. The other chapters would form the body of the report. The last chapter should be concluding in nature and should also discuss the future prospect of the project.

➢ **Appendices**

The Appendix contains material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

- **References / Bibliography**

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project. Project execution is concerned with assessing how much work has been put in.

The File should fulfill the following ***assessment objectives:***

1. Writing a critical literature review

- Search for literature
- Summarizing and presenting the literature
- Evaluating key content and theories

2. Collecting and analyzing research material

- Choosing and designing research method
- Conducting the research
- Analyzing, sorting and classifying the data to make decision

1. Interpreting research method and draw conclusion

- Findings
- Recommendation

2. Assigning the theories and writing the project report

- Structuring the project in accordance with the given style

3. Bibliography

- This refer to the books, Journals and other documents consulting while working on the project

Examination Scheme:

Components	**MRP**	**V**	**S**	**FP**	**R**
Weightage (%)	20	20	20	20	20

MRP – Mid Report Presentation, V – Viva, S – Synopsis, FP – Final Presentation, R - Report

MASTER OF SCIENCE (DATA SCIENCE)

(M.Sc.(D.S.)

Programme Code: 121177

Duration – 2 Years Full Time

Programme Structure
and
Curriculum & Scheme of Examination

2021-23
(Choice Based Credit System)

AMITY UNIVERSITY

R A J A S T H A N

PREAMBLE

Amity University aims to achieve academic excellence by providing multi-faceted education to students and encourage them to reach the pinnacle of success. The University has designed a system that would provide rigorous academic programme with necessary skills to enable them to excel in their careers.

This booklet contains the Programme Structure, the Detailed Curriculum and the Scheme of Examination. The Programme Structure includes the courses (Core and Elective), arranged semester wise. The importance of each course is defined in terms of credits attached to it. The credit units attached to each course has been further defined in terms of contact hours i.e. Lecture Hours (L), Tutorial Hours (T), Practical Hours (P). Towards earning credits in terms of contact hours, 1 Lecture and 1 Tutorial per week are rated as 1 credit each and 2 Practical hours per week are rated as 1 credit. Thus, for example, an L-T-P structure of 3-0-0 will have 3 credits, 3-1-0 will have 4 credits, and 3-1-2 will have 5 credits.

The Curriculum and Scheme of Examination of each course includes the course objectives, course contents, scheme of examination and the list of text and references. The scheme of examination defines the various components of evaluation and the weightage attached to each component. The different codes used for the components of evaluation and the weightage attached to them are:

Components	Codes	Weightage (%)
Case Discussion/ Presentation/ Analysis	C	05 - 10
Home Assignment	H	05 - 10
Project	P	05 - 10
Seminar	S	05 - 10
Viva	V	05 - 10
Quiz	Q	05 - 10
Class Test	CT	10 - 15
Attendance	A	05
End Semester Examination	EE	50

It is hoped that it will help the students study in a planned and a structured manner and promote effective learning. Wishing you an intellectually stimulating stay at Amity University.

July, 2021

PROGRAMME LEARNING OUTCOME (PLO)

MASTER OF SCIENCE(DATA SCIENCE) (M.Sc.(D.S.)

PLO-1 Develop in depth understanding of the key technologies in data science and business analytics: data mining, machine learning, visualization techniques, predictive modeling, and statistics.

PLO-2 Demonstrating practical, hands-on experience with programming languages and tools through lab exercise and project.

PLO-3 Apply data science concepts and methods to solve problems in real-world contexts and will communicate these solutions effectively

PLO-4 Utilize knowledge in a broad range of methods based on statistics and informatics and can use these for data management, analysis and problem solving.

SKILL DEVELOPMENT DETAILS WITH CREDITS OF M.Sc.(D.S.)

Sr. No.	Sem	Skill Development	credit	Employability	Credit	Entrepreneurship	Credit	Total Nos.	Total Credit
1	I	2	4	2	4	2	4	**6**	**12**
2	II	3	7	NIL	NIL	NIL	NIL	**3**	**7**
3	III	2	4	NIL	NIL	2	4	**4**	**8**
	Total	**7**	**15**	**2**	**4**	**4**	**8**	**13**	**27**

SKILL DEVELOPMENT SUBJECTS IN M.SC.(D.S.) PROGRAMME

sem	Name	code	Credit
I	Data Science –I	MDS103	3
I	Data Science -I Lab	MDS123	1
II	Data Science-II with R	MDS202	3
II	Data Science-II with R Lab	MDS222	1
II	Data Engineering	MDS203	3
III	Natural Language Processing	MDS303	3
III	Natural Language Processing Lab	MDS323	1

Employability			
sem	Name	code	Credit
I	Programming with Python	MDS102	3
I	Programming with Python Lab	MDS122	1

Entrepreneurship			
sem	Name	code	Credit
I	Data Warehousing and Mining	MDS104	3
I	Data Warehousing and Mining-Lab	MDA124	1
III	Machine Learning and Deep Learning	MDS302	3
III	Machine Learning and Deep Learning Lab	MDS322	1

PROGRAMME STRUCTURE CREDITS SUMMARY
Master of Science (Data Science) (M.Sc.(DS)-2021

	Credits PG (2 years/ 4 Semesters)							
Semester	CC	DE	VA	OE	EVS	NTCC	ANDP	Total
I	15	0	04	0	0	01	02	22
II	11	07	04	03	0	04	02	31
III	11	07	04	03	0	08	02	35
IV	0	0	0	0	0	25	0	25
Total	37	14	12	06	0	38	06	113

Core Courses	CC
Domain Electives	DE
Value Added Course	VA
Open Electives	OE
Environmental Science	EVS
Project Work (Non Teaching Credit Course)	NTCC
Anandam Project	NTCC

PROGRAMME STRUCTURE SUBJECTWISE CATEGORY SUMMARY
Master of Science (Data Science) (M.Sc.(DS)-2021

	Courses/Subjects for PG (2 years/ 4 Semesters) M.Sc.(DS) Programme							
Semester	CC	DE	VA	OE	EVS	NTCC	ANDP	Total
I	07	0	06	0	0	01	01	15
II	05	06	06	01	0	01	01	20
III	05	06	06	01	0	03	01	22
IV	0	0	0	0	0	02	0	02
Total	17	12	18	02	0	7	03	59

Core Courses	CC
Domain Electives	DE
Value Added Course	VA
Open Electives	OE
Environmental Science	EVS
Project Work (Non Teaching Credit Course)	NTCC
Anandam Project	NTCC

PROGRAMME STRUCTURE

2021-2023

FIRST SEMESTER

Sr. No.	Course Title	Category	Lecture	Tutorial	Practical	Total Credits
Core Courses						
MDS101	Probability and Statistical structures	CC	2	1	-	3
MDS102	Programming with Python	CC	2	1	-	3
MDS103	Data Science -I	CC	2	1	-	3
MDS104	Data Warehousing and Mining	CC	2	1	-	3
MDS122	Programming with Python Lab	CC	-	-	2	1
MDS123	Data Science -I Lab	CC	-	-	2	1
MDS124	Data Warehousing and Mining-Lab	CC	-	-	2	1
Non-Teaching Credit Course (NTCC)						
MDS151	Report on Workshop / Social Work	NTCC	-	-	-	1
AND001	Anandam	NTCC	-	-	-	2
VALUE ADDED COURSES (VAC)						
BCS111	Communication Skills-I	VA	1	-	-	1
BSS111	Behavioural Science-I (Self Development and Interpersonal Skills)	VA	1	-	-	1
FLT111 FLG111 FLS111 FLC111	Foreign Language French German Spanish Chinese	VA	2	-	-	2
Total						**22**

SECOND SEMESTER

Sr. No.	Course Title	Category	Lecture	Tutorial	Practical	Total Credits
Core Courses						
MDS201	Linear Algebra and Matrices	CC	2	1	-	3
MDS202	Data Science-II with R	CC	2	1	-	3
MDS203	Data Engineering	CC	2	1	-	3
MDS222	Data Science-II with R Lab	CC	-	-	2	1
MDS223	Data Engineering Lab	CC	-	-	2	1
DOMAIN ELECTIVES (DE)						
Elective-I (Without Lab) select anyone 1						
MDS231	Business Analytics	DE	2	1	-	3
MDS232	Pattern Recognition	DE				
Elective-II (With Lab) select anyone 1						
MDS233	Image Analytics	DE	2	1	-	3
MDS234	Data Visualization	DE				
MDS243	Image Analytics Lab	DE	-	-	2	1
MDS244	Data Visualization Lab	DE				
Open Elective						
	Open Elective	OE	2	1	-	3
Non-Teaching Credit Course (NTCC)						
MDS250	Minor Project	NTCC	-	-	-	4
AND002	Anandam	NTCC	-	-	-	2
VALUE ADDED COURSES (VAC)						
BCS211	Communication Skills-II	VA	1	-	-	1
BSS211	Behavioural Science-II (Behavioural Communication and Relationship Management)	VA	1	-	-	1
FLT211 FLG211 FLS211 FLC211	Foreign Language French German Spanish Chinese	VA	2	-	-	2
Total						**31**

THIRD SEMESTER

Sr. No.	Course Title	Category	Lecture	Tutorial	Practical	Total Credits
Core Courses						
MDS301	Optimization Techniques	CC	2	1	-	3
MDS302	Machine Learning and Deep Learning	CC	2	1	-	3
MDS303	Natural Language Processing	CC	2	1	-	3
MDS322	Machine Learning and Deep Learning Lab	CC	-	-	2	1
MDS323	Natural Language Processing Lab	CC	-	-	2	1
DOMAIN ELECTIVES (DE)						
Elective-I (Without Lab) select anyone						
MDS331	Big Data For Managers	DE	2	1	-	3
MDS332	Data Science And AI For Managers	DE				
Elective-II (With Lab) select anyone						
MDS333	Artificial Intelligence	DE	2	1	-	3
MDS334	Big Data & Analytics using R	DE				
MDS343	Artificial Intelligence Lab	DE	-	-	2	1
MDS344	Big Data & Analytics using R LAB	DE				
Open Elective						
	Open Elective	OE	2	1	-	3
Non Teaching Credit Course (NTCC)						
MDS350	Minor Project	NTCC	-	-	-	4
MDS351	Report on Paper Presentation in Conference	NTCC	-	-	-	1
MDS352	Summer Internship Project	NTCC	-	-	-	3
AND003	Anandam	NTCC	-	-	-	2
VALUE ADDED COURSES (VAC)						
BCS311	Communication Skills	VA	1	-	-	1
BSS311	Behavioural Science-III (Leading Through Teams)	VA	1	-	-	1
FLT311 FLG311 FLS311 FLC311	Foreign Language French German Spanish Chinese	VA	2	-	-	2
	TOTAL					**35**

FOURTH SEMESTER

S. No.	Course Title	Category	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
Non Teaching Credit Course (NTCC)					
Elective	**Select any ONE**				
MDS460	Project Work	NTCC	-	-	25
MDS461	Internship	NTCC			
	TOTAL				**25**

PROBABILITY AND STATISTICAL STRUCTURES

Course Code	L	T	P/FW	CREDITS	Semester
MDS101	2	1	-	3	1

Course Learning Outcomes:

CLO1: Basic probability axioms and rules and the moments of discrete and continous random variables as well as be familiar with common named discrete and continous random variables.
CLO2:2 How to derive the probability density function of transformations of random variables and use these techniques to generate data from various distributions.
CLO3: How to calculate probabilities, and derive the marginal and conditional distributions of bivariate random variables.
CLO4:.Conduct hypotheses tests concerning population parameters, using industry standard statistical software, for single and multiple populations, based on sample data
CLO5: How to translate real-world problems into probability models.

Course Contents:

Module-I

Introduction to Python- features and basic syntax, interactive shell, editing, saving, and running a script. The concept of data types; variables, assignments; immutable variables; numerical types; arithmetic operators and expressions; understanding error messages; Conditions, boolean logic, logical operators; ranges; Control statements: if-else, loops (for, while); short-circuit (lazy) evaluation

Module-II

Strings and text files; manipulating files and directories; text files: reading/writing text and numbers from/to a file; creating and reading a formatted file.
String manipulations: subscript operator, indexing, slicing a string; strings and number system: converting strings to numbers and vice versa. Binary, octal, hexadecimal numbers

Module-III

Lists, tuples, and dictionaries; basic list operators, replacing, inserting, removing an element; searching and sorting lists; dictionary literals, adding and removing keys, accessing and replacing values; traversing dictionaries. Design with functions: hiding redundancy, complexity; arguments and return values; formal vs actual arguments, named arguments. Recursive functions.

Module-IV

Simple graphics and image processing: “turtle” module; simple 2d drawing - colors, shapes; digital images, image file formats, image processing; Simple image manipulations with 'image' module - convert to bw, greyscale, blur, etc.

Module-V

Classes and OOP: classes, objects, attributes and methods; defining classes; design with classes, data modeling; persistent storage of objects; inheritance, polymorphism, operator overloading; abstract classes; exception handling, try block

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Textbook: *Fundamentals of Python: First Programs* , Author: Kenneth Lambert , Publisher: Course Technology, Cengage Learning, 2012

PROGRAMMING WITH PYTHON

Course Code	L	T	P/FW	CREDITS	Semester
MDS102	2	1	-	3	1

Course Learning outcomes:

CLO1: When students complete Intro to Programming with Python, they will be able to: Build basic programs using fundamental programming constructs like variables, conditional logic, looping, and functions.
CLO2: Work with user input to create fun and interactive programs.

Course Contents:

Module-I

Introduction to Python- features and basic syntax, interactive shell, editing, saving, and running a script. The concept of data types; variables, assignments; immutable variables; numerical types; arithmetic operators and expressions; understanding error messages; Conditions, boolean logic, logical operators; ranges; Control statements: if-else, loops (for, while); short-circuit (lazy) evaluation

Module-II

Strings and text files; manipulating files and directories; text files: reading/writing text and numbers from/to a file; creating and reading a formatted file.
String manipulations: subscript operator, indexing, slicing a string; strings and number system: converting strings to numbers and vice versa. Binary, octal, hexadecimal numbers

Module-III

Lists, tuples, and dictionaries; basic list operators, replacing, inserting, removing an element; searching and sorting lists; dictionary literals, adding and removing keys, accessing and replacing values; traversing dictionaries. Design with functions: hiding redundancy, complexity; arguments and return values; formal vs actual arguments, named arguments. Recursive functions.

Module-IV

Simple graphics and image processing: “turtle” module; simple 2d drawing - colors, shapes; digital images, image file formats, image processing; Simple image manipulations with 'image' module - convert to bw, greyscale, blur, etc.

Module-V

Classes and OOP: classes, objects, attributes and methods; defining classes; design with classes, data modeling; persistent storage of objects; inheritance, polymorphism, operator overloading; abstract classes; exception handling, try block

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Textbook: *Fundamentals of Python: First Programs* , Author: Kenneth Lambert , Publisher: Course Technology, Cengage Learning, 2012

DATA SCIENCE – I

Course Code	L	T	P/FW	CREDITS	Semester
MDS103	2	1	-	3	1

Course Learning Outcomes:

CLO1: By the end of this course, students will: Demonstrate advanced skills in data acquisition and management.
CLO2: Demonstrate advanced skills in data analysis techniques using mathematics and statistical principles.
CLO3: Demonstrate advanced skills in data presentation, communication, and visualization.

Course Contents

Module-I

Data science definition. Data science benefit our society, Data science relation to other domains, Data science application areas, Data science challenges, Various Data science tools and programming platforms for developing data science applications, Role of data scientist, Data science growing market.

Module-II

Various types of databases and datasets such as structured, unstructured, graph, etc., Data related challenges today. Multimedia data, social media data, biological data, sensor data, etc. Different dataset with different challenges.

Module-III

Introduction to R and its history. Advantages of R, Install R Programming Language & R Studio, Various data science packages (machine learning, string manipulation, data visualization) in R and their application area. Various domain-specific datasets available in R, Various data repositories, public and private data repositories.

Module-IV

Companies Using the R Programming language, Commercial market of R programming, In-memory computation in R and its benefits, Parallel and distributed programming computation using R, Package inclusion and industry programming practices. CRAN and various benefits of it, Future prospects of R programming.

Module-V

Machine learning, Supervised and unsupervised machine learning, semi-supervised machine learning, reinforcement learning. Various sub branches of supervised (classification, regression) and unsupervised machine learning (clustering and dimensionality reduction), Training and testing data, Differences between machine learning and statistics

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text and References:

- Hadley Wickham, and Garrett Grolemund. R for Data Science: Import, Tidy, Transform, Visualize, and Model Data 1st Edition. O'Rielley
- Brett Lantz. Machine Learning with R: Expert techniques for predictive modeling, 3rd Edition. Packt Publishing.
- Peter Bruce, Andrew Bruce. Practical Statistics for Data Scientists: 50+ Essential Concepts Using R and Python (2020). O'Rielley Publishing.

DATA WAREHOUSING AND MINING

Course Code	L	T	P/FW	Credits	Semester
MDS104	2	1	-	3	1

Course Learning Outcomes:

CLO1: Be familiar with mathematical foundations of data mining tools.
CLO 2: Understand and implement classical models and algorithms in data warehouses and data mining
CLO3: Characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering.

Course Contents:

Module I: Data Warehousing

Introduction to Data Warehouse, its competitive advantage, Data warehouse vs Operational Data, Things to consider while building Data Warehouse

Module II: Implementation

Building Data warehousing team, Defining data warehousing project, data warehousing project management, Project estimation for data warehousing, Data warehousing project implementation

Module III: Techniques

Bitmapped indexes, Star queries, Read only tablespaces, Parallel Processing, Partition views, Optimizing extraction process

Module IV: Data Mining

From Data ware housing to Data Mining, Objectives of Data Mining, the Business context for Data mining, Process improvement, marketing and Customer Relationship Management (CRM), the Technical context for Data Mining, machine learning, decision support and computer technology.

Module V: Data Mining Techniques and Algorithms

Process of data mining, Algorithms, Data base segmentation or clustering, predictive Modeling, Link Analysis, Data Mining Techniques, Automatic Cluster Detection, Decision trees and Neural Networks.

Module VI: Data Mining Environment

Case studies in building business environment, Application of data ware housing and Data mining in Government, National Data ware houses and case studies.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Data Warehousing, Data Mining & OLAP, Alex Berson, Stephen J. Smith, Tata McGraw-Hill Edition 2004.
- Data Mining: Concepts and Techniques, J. Han, M. Kamber, Academic Press, Morgan Kanf man Publishers, 2001
- Data Ware housing: Concepts, Techniques, Products and Applications, C.S.R. Prabhu, Prentice Hall of India, 2001.

References:

- Mastering Data Mining: The Art and Science of Customer Relationship Management, Berry and Lin off, John Wiley and Sons, 2001.
- Data Mining", Pieter Adrians, Dolf Zantinge, Addison Wesley, 2000.
- Data Mining with Microsoft SQL Server, Seidman, Prentice Hall of India, 2001.

PROGRAMMING WITH PYTHON LAB

Course Code	L	T	P/FW	CREDITS	Semester
MDS122	-	-	2	1	1

Course Learning Outcomes:

CLO1: When students complete Intro to Programming with Python, they will be able to: Build basic programs using fundamental programming constructs like variables, conditional logic, looping, and functions.
CLO2: Work with user input to create fun and interactive programs.

1. Installing Python and configuring environment.
2. To display and find the size of all data types in Python.
3. To show the use of loops
4. To work with different operators including lazy operators.
5. Working with strings operations.
6. Writing and reading to/from a file.
7. To perform operations on list.
8. To perform operations on tuple.
9. To perform operations on dictionary.
10. Working with functions including recursive ones.
11. To perform manipulation with image files.
12. To perform operations on images using turtle module.
13. To show OOP features in Python like encapsulation, inheritance etc.

DATA SCIENCE – I LAB

Course Code	L	T	P/FW	CREDITS	Semester
MDS123	-	-	2	1	1

Course Learning outcomes:

CLO1: By the end of this course, students will: Demonstrate advanced skills in practical data acquisition and management.
CLO2: Demonstrate advanced skills in data analysis techniques using mathematics and statistical principles for practical problems.
CLO3:Demonstrate advanced skills in data presentation, communication, and visualization.

Course Contents

1. Write a program using R to declare a vector, matrix, dataframes, etc.
2. Write a program using R to read and write a dataframe to a .csv and .txt files. Also use various R function on the dataframe
3. Write a program using R to manipulate a dataframe (add and delete rows & columns, update dataframe values, rename columns, change data types, etc.)
4. Write a program using R to show the usage of various R function on the dataframe
5. Write a program using R which uses various built-in R functions on the dataframe such as class, typeof, summary, str, etc.,
6. Write a programs using R to show for loop usage
7. Write programs using R to show for If statement usage
8. Write programs using R to show while and repeat loops usage
9. Write programs using R which uses various forms of Apply function like apply, lapply, sapply, etc.
10. Write a user defined function in R to find min and max from the list of given numbers
11. Write a user defined function in R without using built-in function to find largest and smallest number from the list of given numbers
12. Write a program using R which takes inputs from the user.

Text and References:

- Hadley Wickham, and Garrett Grolemund. R for Data Science: Import, Tidy, Transform, Visualize, and Model Data 1st Edition. O'Rielley
- Brett Lantz. Machine Learning with R: Expert techniques for predictive modeling, 3rd Edition. Packt Publishing.
- Peter Bruce, Andrew Bruce. Practical Statistics for Data Scientists: 50+ Essential Concepts Using R and Python (2020). O'Rielley Publishing.

DATA WAREHOUSING AND MINING LAB

Course Code	L	T	P/FW	CREDITS	Semester
MDS124	-	-	2	1	1

Course Learning Outcomes:

CLO1: Be familiar with mathematical foundations of data mining tools..
CLO2 Understand and implement classical models and algorithms in data warehouses and data mining
CLO3 Characterize the kinds of patterns that can be discovered by association rule mining, classification and clustering.

Software Required: Informatics Tool, Cognos, Todd.

List of Programmes:

1. Write a program to implement text mining.
2. Write a program to implement web mining.
3. Write a program to develop snowflake schema.
4. Write a program to develop the tree schema with the help of binary tree.
5. Write a program to implement BFS and DFS with respect to 2-D modeling.
6. Write a program to implement the basic step of informatics tool.

Examination Scheme:

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

REPORT ON WORKSHOP/ SOCIAL WORK

Course Code	L	T	P	Credit	Semester
MDS 151	-	-	-	1	1

Course Learning Outcomes:

CO1. Identify, Define and justify the scope of the proposed problem
CO3. Propose an optimized solution among the existing solutions
CO3. Apply to code, debugging, and testing tools for implementation
CO4. Prepare the proper documentation for report writing and oral presentation.

Rules and Regulations

- 2nd Year / 3rd Year Students for which the students and the faculty members can start preparations well in advance prior to the scheduled conference / seminar / workshop.
- The number of students going for any conference / seminar / workshop should be manageable.
- A proposal for the proposed conference / seminar / workshop should be drafted and presented to the HoI reflecting the following key points:
    - Entire activity plan
    - Route Map
    - What are the objectives for the students?
    - What they need to learn, do, and prepare before the conference / seminar / workshop?
    - List of prospective students with Contact Details
    - List of Faculty Coordinators with Contact Details
- After getting approval from the HoI, a note sheet should be prepared and all necessary permission and approval from the competent authorities should be obtained.
- The attention and co-operation of all students and parents are requested to attend the conference / seminar / workshop most effectively. Signing of the letter of Indemnity Bond (Consent-cum-Undertaking) is mandatory for all the parents of students going for conference / seminar / workshop in or outside Jaipur. Duly executed Indemnity Bond should be submitted to HoI Office at least 2 days prior to the visit, without which the accompanying Staff coordinator shall not permit the student to participate in the industrial visit
- The list of students participating in conference / seminar / workshop shall be handed over to the concerned HODs, Staff coordinators.
- Students should be present in formals.
- Students should carry the College Identity Cards during their journey.
- Discipline should be maintained during the conference / seminar / workshop. Any violation will be viewed very seriously.
- A report of the conference / seminar / workshop is to be submitted in 5 days time by students / faculty coordinators once the students are back.

The report to be prepared should reflect the following:-

- What happened at the conference / seminar / workshop the students attend and how does it relate in the best way to the preparations and the learning objectives.
- How do the students will use the outcome of conference / seminar / workshop after it is over?
- What will they gain from it and how can they set up activities that transfer the experience into learning?

- Evaluation parameters for the success of the experience of conference / seminar / workshop.

The layout guidelines for the Report:

1. File should be in the following specification:

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components:

- Front Page
- Table of Content
- Acknowledgement
- Student Certificate
- Company Profile (optional)
- Introduction
- Main Body
- References / Bibliography

ASSESSMENT OF THE INTERNSHIP FILE

The student will be provided with the Student Assessment Record (SAR) to be placed in front of the Report File. Each item in the SAR is ticked off when it is completed successfully. The faculty will also assess each item as it is completed. The SAR will be signed by the student and by the faculty to indicate that the File is the student's own work. It will also ensure regularity and meeting the delaines.

Examination Scheme:

Components	**V**	**S**	**R**	**FP**
Weightage (%)	20	20	20	40

V – Viva, S – Synopsis, FP – Final Presentation, R - Report

Course Title: Anandam

Type: Compulsory

Semester I

Course Code:AND001 **Credit Units: 02**

Course Learning Outcomes:

The student should develop:

- Awareness and empathy regarding community issues
- Interaction with the community and impact on society
- Interaction with mentor and development of Student teacher relationship
- Interaction among students, enlarge social network
- Cooperative and Communication skills and leadership qualities
- Critical thinking, Confidence and Efficiency

Course Objectives:

After the completion of this course, students will be able to:

- apply their knowledge and skills to solve specific community problem
- learn to plan, lead, and organize community events have a sense of belonging to their college campus and community and find something they are interested in doing during their free time
- make new friends, expand social network, and boost social skills and mental health.
- be useful to society as it will protect them against stress, frustration, and depression

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants,phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.
- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.

3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
6. For the topic chosen by the group, students are recommended to cover the following points:
    a) Current scenario (Regional, national and international level as applicable)
    b) Future predictions
    c) Duty of the government
    d) Government policies (related to the topic), if any
    e) Duty of public
    f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
3. Conclusion is clearly stated. The underlying logic is explicit.

COMMUNICATION SKILLS-I

CODE	L	T	P/FW	CREDITS	Semester
BCS 111	1	-	-	1	1

Course Learning Outcomes:

CLO1: Investigate their strengths and personal insights to be revealed in a Formal Setup of Communication.

CLO2. Create right selection of words and ideas while also choosing the appropriate networking channel for formal communication

CLO3. Apply their acquired knowledge with the appropriate selection of channel of formal communication.

CLO4: Develop and empower self with the power of Words.

CLO5: Enhance their technical writing capabilities while also learning about do's and don'ts of technical drafting.

Course Contents:

Module I: Listening Skills

Effective Listening: Principles and Barriers
Listening Comprehension on International Standards

Module II: Speaking Skills

Pronunciation and Accent
Reading excerpts from news dailies & magazines
Narrating Incident; Story telling.
Extempore & Role Plays

Module III: Reading Skills

Vocabulary: Synonyms, antonyms, diminutives, homonyms, homophones
Idioms & phrases
Foreign words in English

Module IV: Writing Skills

Writing Paragraphs
Précis Writing
Letter writing
Coherence and structure
Essay writing

Module V: Activities

News reading
Picture reading
Movie magic
Announcements

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A
Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Working in English, Jones, Cambridge
- Business Communication, Raman –Prakash, Oxford
- Speaking Personally, Porter-Ladousse, Cambridge
- Speaking Effectively, Jermy Comfort, et.al, Cambridge

BEHAVIOURAL SCIENCE-I

(Self Development and interpersonal Skills)

CODE	L	T	P/FW	CREDITS	Semester
BSS 111	1	-	-	1	1

Course Learning Outcomes:

CLO1. Investigate strengths and personal insights to be revealed in a Formal Setupof Communication.

.CLO2: Create right selection of words and ideas while also choosing the appropriate networking channel for forma lcommunication

CLO3: Apply their acquired knowledge with the appropriate selection of channel offormal communication

CLO4: Develop and empower self with the power ofWords.

CLO5: Enhance their technical writing capabilities while also learning about do's and don'ts of technical drafting.

Course Contents:

Module I: Understanding Self

Formation of self concept
Dimension of Self
Components of self
Self Competency

Module II: Self-Esteem: Sense of Worth

Meaning and Nature of Self Esteem
Characteristics of High and Low Self Esteem
Importance & need of Self Esteem
Self Esteem at work
Steps to enhance Self Esteem

Module III: Emotional Intelligence: Brain Power

Introduction to EI
Difference between IQ, EQ and SQ
Relevance of EI at workplace
Self assessment, analysis and action plan

Module IV: Managing Emotions and Building Interpersonal Competence

Need and importance of Emotions
Healthy and Unhealthy expression of emotions
Anger: Conceptualization and Cycle
Developing emotional and interpersonal competence
Self assessment, analysis and action plan

Module V: Leading Through Positive Attitude

Understanding Attitudes
Formation of Attitudes
Types of Attitudes
Effects of Attitude on
Behaviour
Perception
Motivation
Stress
Adjustment
Time Management
Effective Performance
Building Positive Attitude

Module VI: End-of-Semester Appraisal

Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Examination Scheme:

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
Weightage (%)	20	05	20	30	25

Text & References:

- Towers, Marc: Self Esteem, 1st Edition 1997, American Media
- Pedler Mike, Burgoyne John, Boydell Tom, A Manager's Guide to Self-Development: Second edition, McGraw-Hill Book Company.
- Covey, R. Stephen: Seven habits of Highly Effective People, 1992 Edition, Simon & Schuster Ltd.
- Khera Shiv: You Can Win, 1st Edition, 1999, Macmillan
- Gegax Tom, Winning in the Game of Life: 1st Edition, Harmony Books
- Chatterjee Debashish, Leading Consciously: 1998 1st Edition, Viva Books Pvt. Ltd.
- Dr. Dinkmeyer Don, Dr. Losoncy Lewis, The Skills of Encouragement: St. Lucie Press.
- Singh, Dalip, 2002, Emotional Intelligence at work; First Edition, Sage Publications.
- Goleman, Daniel: Emotional Intelligence, 1995 Edition, Bantam Books
- Goleman, Daniel: Working with E.I., 1998 Edition, Bantam Books.

FRENCH

CODE	L	T	P/FW	CREDITS	Semester
FLT 111	2	-	-	2	1

Course Learning Outcomes:

CLO1. Identify and express in French vocabulary and grammar norms
CLO2. Interpret different types of texts as well as cultural ideas and themes.
CLO3. Demonstrate comprehension of nuance between script and sound in French
CLO4. Narrate clearly ideas, themes in simple standard French

Course Objective:

To familiarize the students with the French language

- with the phonetic system
- with the syntax
- with the manners
- with the cultural aspects

Course Contents:

Module A: pp. 01 to 37: Unités 1, 2, Unité 3 Objectif 1, 2
Only grammar of Unité 3: objectif 3, 4 and 5

Contenu lexical: Unité 1: Découvrir la langue française: (oral et écrit)

1. se présenter, présenter quelqu'un, faire la connaissance des autres, formules de politesse, rencontres
2. dire/interroger si on comprend
3. Nommer les choses

Unité 2: Faire connaissance

1.donner/demander des informations sur une personne, premiers contacts, exprimer ses goûts et ses préférences
2.Parler de soi: parler du travail, de ses activités, de son pays, de sa ville.

Unité 3: Organiser son temps

1. dire la date et l'heure

Contenu grammatical:

1. organisation générale de la grammaire
2. article indéfini, défini, contracté
3. nom, adjectif, masculin, féminin, singulier et pluriel
4. négation avec « de », "moi aussi", "moi non plus"
5. interrogation: Inversion, est-ce que, qui, que, quoi, qu'est-ce que, où, quand, comment, quel(s), quelle(s)
   Interro-négatif: réponses: oui, si, non
6. pronom tonique/disjoint- pour insister après une préposition
7. futur proche

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1

GERMAN

CODE	L	T	P/FW	CREDITS	Semester
FLG 111	2	-	-	2	1

Course Learning Outcomes:

CLO1. understand and give instructions
CLO2. understand and reply to a letter
CLO3. speak about learning languages
CLO4. find a particular information in a text
CLO5. understand a conversation

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany

Course Contents:

Module I: Introduction

Self introduction: heissen, kommen, wohnwn, lernen, arbeiten, trinken, etc.
All personal pronouns in relation to the verbs taught so far.
Greetings: Guten Morgen!, Guten Tag!, Guten Abend!, Gute Nacht!, Danke sehr!, Danke!, Vielen Dank!, (es tut mir Leid!),
Hallo, wie geht's?: Danke gut!, sehr gut!, prima!, ausgezeichnet!,
Es geht!, nicht so gut!, so la la!, miserabel!

Module II: Interviewspiel

To assimilate the vocabulary learnt so far and to apply the words and phrases in short dialogues in an interview – game for self introduction.

Module III: Phonetics

Sound system of the language with special stress on Dipthongs

Module IV: Countries, nationalities and their languages

To make the students acquainted with the most widely used country names, their nationalitie and the language spoken in that country.

Module V: Articles

The definite and indefinite articles in masculine, feminine and neuter gender. All Vegetables, Fruits, Animals, Furniture, Eatables, modes of Transport

Module VI: Professions

To acquaint the students with professions in both the genders with the help of the verb "sein".

Module VII: Pronouns

Simple possessive pronouns, the use of my, your, etc.
The family members, family Tree with the help of the verb "to have"

Module VIII: Colours

All the color and color related vocabulary – colored, colorful, colorless, pale, light, dark, etc.

Module IX: Numbers and calculations – verb "kosten"

The counting, plural structures and simple calculation like addition, subtraction, multiplication and division to test the knowledge of numbers.

"Wie viel kostet das?"

Module X: Revision list of Question pronouns

W – Questions like who, what, where, when, which, how, how many, how much, etc.

Examination Scheme:

Components	**CT1**	**CT2**	**C**	**I**	**V**	**A**
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH

CODE	L	T	P/FW	CREDITS	Semester
FLS 111	2	-	-	2	1

Course Learning Outcomes:

1. Identify and express in Spanish vocabulary and grammar norms
2. Interpret different types of texts as well as cultural ideas and themes.
3. Demonstrate comprehension of nuance between script and sound in Spanish
4. Narrate clearly ideas, themes in simple standard Spanish

Course Objective:

To enable students acquire the relevance of the Spanish language in today's global context, how to greet each other, how to present / introduce each other using basic verbs and vocabulary

Course Contents:

Module I

A brief history of Spain, Latin America, the language, the culture…and the relevance of Spanish language in today's global context.
Introduction to alphabets

Module II

Introduction to '*Saludos*' (How to greet each other. How to present / introduce each other).
Goodbyes (despedidas)
The verb *llamarse* and practice of it.

Module III

Concept of Gender and Number
Months of the years, days of the week, seasons. Introduction to numbers 1-100, Colors, Revision of numbers and introduction to ordinal numbers.

Module IV

Introduction to *SER* and *ESTAR* (both of which mean To Be).Revision of '*Saludos*' and '*Llamarse*'. Some adjectives, nationalities, professions, physical/geographical location, the fact that spanish adjectives have to agree with gender and number of their nouns. Exercises highlighting usage of *Ser* and *Estar*.

Module V

Time, demonstrative pronoun (Este/esta, Aquel/aquella etc)

Module VI

Introduction to some key AR /ER/IR ending regular verbs.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras

CHINESE

CODE	L	T	P/FW	CREDITS	Semester
FLC 111	2	-	-	2	1

Course Learning outcomes

CLO1. Read, write and speak approx. 100New Chinesewords and understand basic grammar points.
CLO2. Interpretwords, phrases and sentences of Greetings, personal information like self-introduction, family, Hobbies, abilities Expression of gratitude apology etc .
CLO3. Write Chinesecharacters, simple sentence and a paragraph on Greetings, personal information like self-introduction, family, Hobbies, abilities Expression of gratitude apology etc

Course Objective:

There are many dialects spoken in China, but the language which will help you through wherever you go is Mandarin, or Putonghua, as it is called in Chinese. The most widely spoken forms of Chinese are Mandarin, Cantonese, Gan, Hakka, Min, Wu and Xiang. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I

Show pictures, dialogue and retell.
Getting to know each other.
Practicing chart with Initials and Finals. (CHART – The Chinese Phonetic Alphabet Called "Hanyu Pinyin" in Mandarin Chinese.)
Practicing of Tones as it is a tonal language.
Changes in 3rd tone and Neutral Tone.

Module II

Greetings
Let me Introduce
The modal particle "ne".
Use of Please 'qing" – sit, have tea …….. etc.
A brief self introduction – Ni hao ma? Zaijian!
Use of "bu" negative.

Module III

Attributives showing possession
How is your Health? Thank you
Where are you from?
A few Professions like – Engineer, Businessman, Doctor, Teacher, Worker.
Are you busy with your work?
May I know your name?

Module IV

Use of "How many" – People in your family?
Use of "zhe" and "na".
Use of interrogative particle "shenme", "shui", "ma" and "nar".

How to make interrogative sentences ending with “ma”.
Structural particle “de”.
Use of “Nin” when and where to use and with whom. Use of guixing.
Use of verb “zuo” and how to make sentences with it.

Module V
Family structure and Relations.
Use of “you” – “mei you”.
Measure words
Days and Weekdays.
Numbers.
Maps, different languages and Countries.

Examination Scheme:

Components	**CT1**	**CT2**	**C**	**I**	**V**	**A**
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation, I – Interaction/Conversation Practice

Text & References:
“Elementary Chinese Reader Part I” Lesson 1-10

LINEAR ALGEBRA AND MATRICES

Course Code	L	T	P/FW	Credits	Semester
MDS201	2	1	-	3	1

Course Learning Outcomes:

CLO1. Identify matrix operations.

CLO2. Understand the meaning of limit , continuity and differentiation.

CLO3. Evaluate a definite integral using the Fundamental Theorem of Calculus.

CLO4. Identify a general method for constructing solutions to inhomogeneous linear constant-coefficient

Second-order equations.

CLO5. Demonstrate Scalar multiplication, magnitude, Vector multiplication and Simple application of

Vectors, slope of straight line, centre, radius and equation of circle.

Prerequisite: Nil

Module I

SYSTEM OF LINEAR EQUATIONS AND MATRICES: System of linear equations, Gauss – elimination, Elementary matrices and a method for finding inverse of a matrix.

Module II

VECTOR SPACES: Vector spaces and subspaces – Linear combination, Span, Linear independence and dependence - Null space, Column space, and Row space – Basis and dimension of a vector space – Rank and nullity.

Module III

LINEAR TRANSFORMATION: Introduction to linear transformations – General Linear Transformations – Kernel and range – Matrices of general linear transformation- Geometry linear operators-Change of basis

Module IV

EIGEN VALUES AND EIGEN VECTORS: Introduction to Eigen values- Diagonalizing a matrix- Orthogonal diagonalization-, Applications to differential equations- Positive definite matrices- Similar matrices –Quadratic forms.

Module V

INNER PRODUCT SPACES: Inner product, Length, angle and orthogonality – Orthogonal sets – Orthogonal projections – Inner product spaces – Orthonormal basis: Gram-Schmidt process – QR Decomposition.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Reference Books

1. Howard Anton and Chris Rorres, “Elementary Linear Algebra”, Wiley, 2011.
2. David C. Lay, “Linear Algebra and its Applications“, Pearson Education, 2011.
3. Gilbert Strang, “Linear Algebra and its Applications”, Thomson Learning, 2009.
4. Steven J. Leon, “Linear Algebra with Applications”, Prentice Hall, 2006.

DATA SCIENCE – II WITH R

Course Code	L	T	P/FW	CREDITS	Semester
MDS202	2	1	-	3	1

Course Learning Outcomes:

CLO1: Introduction to data science life cycle.
CLO2: In depth knowledge of most popular machine learning techniques.
CLO3: Supervised and unsupervised learning techniques. Real life case studies and simulated projects to sharpen your skill sets.

Course Contents

Module-I

Analyze data, mean, mode, data types, basic data analysis functions such as str, nrow, ncol, mean, mode, class, etc., Parametric and non-parametric data, Advantages of Parametric Tests, ANOVA, T-Test, F-test, Z-test, Wilcox-Test, Importance of them, Import and export of various types of data files in R. How to read web data, social media data. Basic data plotting.

Module-II

Missing values and their effects on data, Outliers and their effects on data, Importance of identifying missing values and outliers. Classical methods to identify missing values and outliers. Conditions to replace missing values and outliers, Conditions to delete missing values and outliers.

Module-III

Linear regression, multiple linear regression, non-linear regression, When to do linear and non-linear regression, Performance evaluation of regression results. Logistic regression, Analyze the prediction results using various statistics of confusion matrix such as accuracy, sensitivity, specificity, etc. Visualize confusion regression results.

Module-IV

Supervised learning: Classification and regression using Support Vector Machine, Random Forest, Neural Networks, Naive Bayes, and Decision Tress supervised machine learning algorithms. Performance evaluation and parameter tuning to improve results.

Module-V

Unsupervised Learning: K-Means Clustering, Density-Based Spatial Clustering of Applications with Noise (DBSCAN), Expectation–Maximization (EM) Clustering etc. Principal component Analysis. Determination of the number of clusters. Performance evaluation metrics such as Root-mean-square standard deviation (RMSSTD) of the new cluster, R-squared (RS), Dunn's Index (DI).

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text and References:

- Hadley Wickham, and Garrett Grolemund. R for Data Science: Import, Tidy, Transform, Visualize, and Model Data 1st Edition. O'Rielley
- Brett Lantz. Machine Learning with R: Expert techniques for predictive modeling, 3rd Edition. Packt Publishing.
- Peter Bruce, Andrew Bruce. Practical Statistics for Data Scientists: 50+ Essential Concepts Using R and Python (2020). O'Rielley Publishing.

DATA ENGINEERING

Course Code	L	T	P/FW	Credits	Semester
MDS203	2	1	-	3	1

Course Learning Outcomes:

CLO1: To learn the fundamentals of data engineering this includes the overview, issues, initiatives, and standards worldwide based on R language implementation.
CLO 2: To analyze the data engineering process and Framework in terms of data science with practical implementation with R.
CLO 3: To understand the issues related with anomalies and or outliers and its effects on machine learning model with R language solution.
CLO 4: To study and develop concepts about Missing values, Reason why they can reduce performance of machine learning model in R programming environment.

Course Contents

Module-I
Concepts, processes, and tools for data engineering. To understand the modern data ecosystem. Role of the data engineers. Different properties and behaviors of data and its importance. Role of good quality data in machine learning model.

Module-II
Anomalies or outliers, Reasons that outliers may reduce machine learning model performance, Conditions to delete outlier observation and when to predict it, Two real-world cases studies to show why it is important to detect outliers?

Module-III
Missing values, Reason why they can reduce performance of machine learning model, Conditions when to delete missing observation and when to impute it, Two real-world cases studies to show importance to detecting missing values and to delete or impute them

Module-IV
Concept of dimensionality reduction. On what basis we select feature that needed to be removed. Reducing dimension somewhat solve big data problem. Dimensionality reduction may improve accuracy of a machine learning model. Feature extraction and its importance. Various tools and platforms for feature selection, extration and visualization.

Module-V

3 Real world case studies (Name)

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text and References:

- Rajesh Kumar Shukla et al. Data, Engineering and Applications: Volume 1. Springer; 1st ed. 2019 edition (7 May 2019)
- Rajesh Kumar Shukla et al. Data, Engineering and Applications: Volume 2. Springer; 1st ed. 2019 edition (7 May 2019)
- Brian Shive. Data Engineering: A Novel Approach to Data Design

DATA SCIENCE-II WITH R LAB

Course Code	L	T	P/FW	Credits	Semester
MDS222	-	-	2	1	1

Course Learning Outcomes:

CLO1: You will gain an understanding of several different types of data repositories such as relational and non-relational databases, data warehouses, data marts, and data lakes.
CLO2: You will learn about ETL and ELT processes, data pipelines, and data integration platforms.
CLO3: Students will learn how to execute various algorithms on practical problems on data science
CLO4: Introduction to data science life cycle. In depth knowledge of most popular machine learning techniques. Supervised and unsupervised learning techniques. Real life case studies and simulated projects to sharpen your skill sets.

Course Contents

1. Write R program to perform various parametric and non-parametric test on the given data.
2. Write R program to perform linear, and multi-regression
3. Write R program to perform non-linear regression
4. Write R program to classify given dataset using SVM. Divide data into 70% training and 30% testing data
5. Write R program to classify given dataset using Naive Bayes. Divide data into 70% training and 30% testing data
6. Write R program to classify given dataset using Random Forest, and Neural Networks. Divide data into 70% training and 30% testing data.
7. Write R program to classify given dataset using C5.0. Divide data into 70% training and 30% testing data.
8. Write R program to improve the performance of machine learning algorithms
9. Write R program to visualize classification results through confusion matrix.
10. Write R program to perform clustering on a given the datasets. Divide data into 70% training and 30% testing data. Try to improve cluster performance.
11. Write R program to visualize clustering results through plots and charts.
12. Solve a real-world case study by apply appropriate machine learning algorithm

Text and References:

- Hadley Wickham, and Garrett Grolemund. R for Data Science: Import, Tidy, Transform, Visualize, and Model Data 1st Edition. O'Rielley
- Brett Lantz. Machine Learning with R: Expert techniques for predictive modeling, 3rd Edition. Packt Publishing.
- Peter Bruce, Andrew Bruce. Practical Statistics for Data Scientists: 50+ Essential Concepts Using R and Python (2020). O'Rielley Publishing.

DATA ENGINEERING LAB

Course Code	L	T	P/FW	Credits	Semester
MDS223	-	-	2	1	1

Course Learning Outcomes:

CLO1: To learn the fundamentals of data engineering this includes the overview, issues, initiatives, and standards worldwide based on R language implementation.
CLO 2: To analyze the data engineering process and Framework in terms of data science with practical implementation with R.
CLO 3: To understand the issues related with anomalies and or outliers and its effects on machine learning model with R language solution.
CLO 4: To study and develop concepts about Missing values, Reason why they can reduce performance of machine learning model in R programming environment.

Experiments

1. Write programs in R to find out various properties of datasets
2. Write programs in R to visualize the datasets
3. Write programs in R to detect outliers
4. Write programs in R to visualize outliers using plots
5. Write R program to remove and predict outliers
6. Write programs in R to detect missing values
7. Write programs in R to visualize missing value in a dataset using plots
8. Write R program to impute missing values
9. Write R program to find feature importance using PCA
10. Write R program to find feature importance using machine learning
11. Write R program to visualize predict results with and without feature selection
12. Write R program to extract new features from the dataset

BUSINESS ANALYTICS

Course Code	L	T	P/FW	Credits	Semester
MDS231	2	1	-	3	1

Course Learning Outcomes:

CLO1: Understand and critically apply the concepts and methods of business analytics.
CLO2: Identify, model and solve decision problems in different settings.
CLO3: Interpret results/solutions and identify appropriate courses of action for a given managerial situation whether a problem or an opportunity.

Course Contents:

Module I: Introduction to Business Intelligence
Introduction to digital data and its types- structured, semi-structured and unstructured, Introduction to OLTP and OLAP (MOLAT, ROLAP, HOLOAT), BI Definitions and Concepts, BI Framework, Data Warehousing concepts and its role in BI, BI Infrastructure Components- BI Process, BI Technology, BI Roles & Responsibilities, Business Applications of BI, BI best practices

Module II: Basics of Data Integration (Extraction Transformation Loading)
Concepts of data integration, needs and advantages of using data integration, introduction to common data integration approaches, Meta data- types and sources, Introduction to data quality, data profiling concepts and application, Introduction to ETL using Kettle

Module III: Data Introduction to Multi-Dimensional Data Modeling
Introduction to data and dimension modeling, multidimensional data model, ER Modeling VS multi-dimensional modeling, concepts of dimension , facts, cubes, attribute, hierarchies, star and snowflake schemas, introduction to business metrics and KPIs, creating cubes using Microsoft Exce.

Module IV: Basics of Enterprise Reporting
A typical enterprise, Malcom Baldrige- quality performance framework, balanced scorecard, enterprise dashboard, balanced scorecard VS enterprise dashboard, enterprise reporting using MS Access/ MS Excel, best practices in the design of enterprise dashboards.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Fundamentals of Business Analytics – R. N. Prasad & Seema Acharya,
  Business Intelligence (2nd Edition), Efraim Turban, Ramesh Sharda, Dursun Delen, David King
- Delivering Business Intelligence with Microsoft SQL Server 2012, Brian Larson

PATTERN RECOGNITION

Course Code	L	T	P/FW	Credits	Semester
MDS 232	2	1	-	3	1

Course Learning outcomes:

CLO1: Explain and compare a variety of pattern classification, structural pattern recognition, and pattern classifier combination techniques.
CLO2: Summarize, analyze, and relate research in the pattern recognition area verbally and in writing.

Course Contents:

Module I: Basics of Probability and Linear Algebra

Probability: independence of events, conditional and joint probability, Bayes theorem Random Processes: Stationary and non-stationary processes, Expectation, Autocorrelation, Cross-Correlation.

Linear Algebra: Inner product, outer product, inverses, eigen values, eigen vectors, singular values, singular vectors.

Module II: Decision Theory

Bayes Decision Theory : Minimum-error-rate classification. Classifiers, Discriminant functions, Decision surfaces. Normal density and discriminant functions. Discrete features.

Module III: Parameter Estimation Methods

Maximum-Likelihood estimation :Gaussian case. Maximum a Posteriori estimation. Bayesian estimation: Gaussian case. Unsupervised learning and clustering - Criterion functions for clustering. Algorithms for clustering: K-Means, Hierarchical and other methods. Cluster validation. Gaussian mixture models, Expectation-Maximization method for parameter estimation. Maximum entropy estimation. Hidden Markov Models (HMMs). Discrete HMMs. Continuous HMMs. Nonparametric techniques for density estimation. K-Nearest Neighbour method.

Module IV: Dimensionality reduction

Principal component analysis - it relationship to eigen analysis. Fisher discriminant analysis - Generalised eigen analysis. Eigen vectors/Singular vectors as dictionaries. Factor Analysis, Total variability space - a dictionary learning methods. Non negative matrix factorisation - a dictionary learning method.

Module V: Linear discriminant functions

Gradient descent procedures, Perceptron, Support vector machines - a brief introduction.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- R.O.Duda, P.E.Hart and D.G.Stork, Pattern Classification, John Wiley, 2001
- S.Theodoridis and K.Koutroumbas, Pattern Recognition, 4th Ed., Academic Press, 2009
- C.M.Bishop, Pattern Recognition and Machine Learning, Springer, 2006

IMAGE ANALYTICS

Course Code	L	T	P/FW	Credit	Semester
MDS233	2	1	-	3	1

Course Learning Outcomes:

CLO1: Apply the definitions of the image classification and analysis problem to common problems in computer vision.
CLO2. Explain the basics of object recognition and image search,
CLO3: object detection techniques, motion estimation, object tracking in video using convolutional filters.

Course Contents

Module-I
Various types of images (jpg, png, tiff, bitmap, etc) Different are various image parameters (pixels, dimensions, etc.). Video in terms of data. Application areas of image analytics and its importance and present state-of-the-art, Image Analysis Workflow.

Module-II
Read images in R, Convert image (colored, black & white) into dataset, Analyze the dataset, Convert video into image frames. Apply various functions on images (rotate, resize, blur, brightness, etc.), Various R packages for image manipulations.

Module-III
Image classification for colored and B&W images: Image classification using various supervised learning algorithms (SVM, Random Forests, Deep Learning, etc.). Performance evaluation of image classification model. Popular application areas.

Module-IV
Image Segmentation for colored and B&W images: Image segmentation using various supervised and unsupervised learning algorithms (SVM, Random Forests, Deep Learning, KMean, etc.). Performance evaluation of image classification model. Popular application areas.

Module-V
Two real world image analytics case studies such as face mask recognition, vehicle detection, etc.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text and References:

- Hadley Wickham, and Garrett Grolemund. R for Data Science: Import, Tidy, Transform, Visualize, and Model Data 1st Edition. O'Rielley
- Brett Lantz. Machine Learning with R: Expert techniques for predictive modeling, 3rd Edition. Packt Publishing.
- Peter Bruce, Andrew Bruce. Practical Statistics for Data Scientists: 50+ Essential Concepts Using R and Python (2020). O'Rielley Publishing.

DATA VISUALIZATION

Course Code	L	T	P/FW	Credits	Semester
MDS234	2	1	-	3	1

Course Learning Outcomes:

CLO1: To familiarize students with the stages of the visualization pipeline, including data modeling,
CLO2: Mapping data attributes to graphical attributes, perceptual issues, existing visualization
CLO3: paradigms, techniques, and tools, and evaluating the effectiveness of visualizations for specific data, task, and user types.

Course Contents:

Module I: Data preparation and manipulation

Python and Jupyter notebook overview, Introduction to numpy; create arrays with numpy and Python; operations on multiple arrays and scalars; universal array functions in numpy; transpose arrays with numpy; import and export arrays. Introduction to Pandas – series, data frames, index Series and data frames in pandas, re-index, drop entry, data alignment, rank and sort data entries, summary statistics in pandas, dealing with missing data; reading and writing files.

Merge, concatenate and combining data frames, reshaping, pivoting, handling duplicates in data frame, mapping with pandas, replace, rename indexes in pandas, using bins, find outliers in your data with pandas, group by on data frames, group by on dictionary and series, aggregation, split-apply-combine technique, cross-tabulation in pandas

Module-II: Data Visualization in Python

Installing seaborn; create histograms using seaborn, KDE plots, combining plot styles, combine histograms, and rug plots, box and violin plots, regression plots, heat maps with seaborn.

Module-III: Data Visualization in R

introduction to R; ggplot2 foundations- geometries, facets, statistics, export plot; data wrangling- data transformation, grouping, piping, pivoting, transform and visualize data; exploratory data analysis- histogram and density plot, frequency polygon, area plot, bar plot; scatter plot, rug plot, bivariate distribution, boxplot, violin plot, matrix plots;

Module-IV: Advanced Data Visualization in R

Size and shape of points- facet wrap, facet grid, rmarkdown; pie chart, donut chart, time series visualization, waterfall chart, radar chart, parallel coordinates plot, heat map, mosaic plot; plot customization- themes, annotations and labels

Module-V: Visualization Techniques in Tableau

Domain padding and densification; data preparation using excel and custom SQL; viola chart; hexbin chart; advanced table calculations- addressing and partitioning; nested table calculations; sankey diagram- base sankey calculations, secondary calculations, nested table calculations; likert scale visualization - data preparation: lookups, cleaning, and pivoting, base likert calculations; dashboard layout techniques;

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

IMAGE ANALYTICS LAB

Course Code	L	T	P/FW	Credits	Semester
MDS243	-	-	2	1	2

Course Learning Outcomes:

CLO1: Apply the definitions of the image classification and analysis problem to common problems in computer vision.
CLO2. Explain the basics of object recognition and image search, object detection techniques, motion estimation,
CLO3:object tracking in video using convolutional filters.

Experiment

1. Read different types of images into R and check their parameters
2. Convert image to a dataframe, save image data into .csv file
3. Perform various image editing function like resize, scaling, rotating
4. Label images, and divide image data into train and test
5. Perform binary classification of images using SVM
6. Perform multiclass classification using Random Forest
7. Perform multiclass classification using Naïve Bayes
8. Visualize image classification results
9. Perform image segmentation using Decision tree.
10. Perform image segmentation using ANN.
11. Visualize image segmentation results
12. Various image editing tools.

DATA VISUALIZATION LAB

Course Code	L	T	P/FW	Credits	Semester
MDS 244	-	-	2	1	1

Course Learning outcomes:

CLO1: To familiarize students with the stages of the visualization pipeline, including data modeling,
CLO2: mapping data attributes to graphical attributes, perceptual issues, existing visualization paradigms, techniques, and tools, and
CLO3:evaluating the effectiveness of visualizations for specific data, task, and user types.

List of Programmes:

1. Operations with arrays using numpy.
2. operations on multiple arrays and scalars
3. Operations on data frames in pandas.
4. File reading and writing.
5. Using histogram and plots using seaborn.
6. Visualizing data using R: plots, transformation, grouping,
7. Implementing various plots in R, histogram, pivoting, bivariate distribution.
8. Implementing facet wrap and grid in R
9. Visualizing and working on time series data in R/ Python.
10. Visualizing and working on charts in Tableau.
11. likert scale visualization in Tableau.
12. dashboard layout techniques in Tableau.

MINOR PROJECT

COURSE CODE	L	T	P/FW	CREDIT UNITS	Semester
MDS250	-	-	-	4	2

GUIDELINES FOR PROJECT FILE

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation.

Research is genuine exploration of the unknown that leads to new knowledge, which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals.
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

Report Layout

The report should contain the following components

1. File should be in the following specification

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components

Front Page
Table of Contents
Acknowledgement
Student Certificate
Company Profile
Introduction
Chapters
Appendices
References / Bibliography

- **Title or Cover Page or Front Page**

The title page should contain the following information: Project Title; Student's Name; Course; Year; Supervisor's Name.

- **Table of Contents**

Titles and subtitles are to correspond exactly with those in the text.

- **Acknowledgement**

Acknowledgment to any advisory or financial assistance received in the course of work may be given.

- **Student Certificate**

Given by the Institute.

- **Company Certificate & Profile**

This is a certificate, which the company gives to the students. A Company Profile corresponds to a file with company-specific data. Company data can be stored there and included in a booking when needed.

- **Introduction**

Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

- **Chapters**

All chapters and sections must be appropriately numbered, titled and should neither be too long nor too short in length.

The first chapter should be introductory in nature and should outline the background of the

project, the problem being solved, the importance, other related works and literature survey.

The other chapters would form the body of the report. The last chapter should be concluding

in nature and should also discuss the future prospect of the project.

- **Appendices**

The Appendix contains material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

- **References / Bibliography**

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project. Project execution is concerned with assessing how much work has been put in.

The File should fulfill the following ***assessment objectives:***

1. Writing a critical literature review
    - Search for literature
    - Summarizing and presenting the literature
    - Evaluating key content and theories

2. Collecting and analyzing research material
    - Choosing and designing research method
    - Conducting the research
    - Analyzing, sorting and classifying the data to make decision

3. Interpreting research method and draw conclusion
    - Findings
    - Recommendation

4. Assigning the theories and writing the project report
    - Structuring the project in accordance with the given style

5. Bibliography
    - This refer to the books, Journals and other documents consulting while working on the project

Examination Scheme:

Components	**MRP**	**V**	**S**	**FP**	**R**
Weightage (%)	20	20	20	20	20

MRP – Mid Report Presentation, V – Viva, S – Synopsis, FP – Final Presentation, R - Report

Course Title: Anandam

Type: Compulsory

Semester II

Course Code:AND002 **Credit Units: 02**

Course Learning Outcomes:

The student should develop:

- Awareness and empathy regarding community issues
- Interaction with the community and impact on society
- Interaction with mentor and development of Student teacher relationship
- Interaction among students, enlarge social network
- Cooperative and Communication skills and leadership qualities
- Critical thinking, Confidence and Efficiency

Course Objectives:

After the completion of this course, students will be able to:

- apply their knowledge and skills to solve specific community problem
- learn to plan, lead, and organize community events have a sense of belonging to their college campus and community and find something they are interested in doing during their free time
- make new friends, expand social network, and boost social skills and mental health.
- be useful to society as it will protect them against stress, frustration, and depression

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants,phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page

- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.
- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.
3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
6. For the topic chosen by the group, students are recommended to cover the following points:
    a) Current scenario (Regional, national and international level as applicable)
    b) Future predictions
    c) Duty of the government
    d) Government policies (related to the topic), if any
    e) Duty of public
    f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
3. Conclusion is clearly stated. The underlying logic is explicit.

COMMUNICATION SKILLS-II

CODE	L	T	P/FW	CREDITS	Semester
BCS 211	1	-	-	1	1

Course Learning Outcomes:

CLO1. Identify essentials components of language

CLO2. Make inferences and predictions about spoken discourse

CLO3. Develop Creative & Literary Sensitivity in global situation

CLO4. Identify features of a reading textbook and utilize them as needed

Course Objective:

To enrich the understanding of English language and communication, structure, style, usage, and vocabulary for global business purposes.

Course Contents:

Module I: Fundamentals of Communication

Role and purpose of communication: *7 C's of communication*
Barriers to effective communication
Enhancing listening
Forms of Communication: one-to-one, informal and formal

Module II: Verbal Communication (Written)

Business Letter
Social correspondence
Writing resume and Job applications

Module III: Speaking skills

Conversational English
Guidelines to give an effective presentation
Activities to include:
Presentations by students
Just a minute

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A
Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Business Communication, Raman – Prakash, Oxford
- Textbook of Business Communication, Ramaswami S, Macmillan
- Speaking Personally, Porter-Ladousse, Cambridge

BEHAVIOURAL SCIENCE-II
(Behavioural Communication and Relationship Management)

CODE	L	T	P/FW	CREDITS	Semester
BSS 211	1	-	-	1	1

Course Learning Outcomes:

1. Recognize the relation critical thinking with various mental processes.
2. Identify hinderance to problem solving processes.
3. Analyse the steps in problem-solving process.
4. Createplan of action applying creative thinking.

Course Objective:

This course aims at imparting an understanding of:
Process of Behavioural communication
Aspects of interpersonal communication and relationship
Management of individual differences as important dimension of IPR

Course Contents:

Module I: Behavioural Communication
Scope of Behavioural Communication
Process – Personal, Impersonal and Interpersonal Communication
Guidelines for developing Human Communication skills
Relevance of Behavioural Communication in relationship management

Module II: Managing Individual Differences in Relationships
Principles
Types of issues
Approaches
Understanding and importance of self disclosure
Guidelines for effective communication during conflicts

Module III: Communication Climate: Foundation of Interpersonal Relationships
Elements of satisfying relationships
Conforming and Disconforming Communication
Culturally Relevant Communication
Guideline for Creating and Sustaining Healthy Climate

Module IV: Interpersonal Communication
Imperatives for Interpersonal Communication
Models – Linear, Interaction and Transaction
Patterns – Complementary, Symmetrical and Parallel
Types – Self and Other Oriented
Steps to improve Interpersonal Communication

Module V: Interpersonal Relationship Development
Relationship circle – Peer/ Colleague, Superior and Subordinate
Initiating and establishing IPR

Escalating, maintaining and terminating IPR
Direct and indirect strategies of terminating relationship
Model of ending relationship

Module VI: End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Examination Scheme:

Components	**SAP**	**A**	**Mid Term Test (CT)**	**VIVA**	**Journal for Success (JOS)**
Weightage (%)	20	05	20	30	25

Text & References:

- Vangelist L. Anita, Mark N. Knapp, Inter Personal Communication and Human Relationships: Third Edition, Allyn and Bacon
- Julia T. Wood. Interpersonal Communication everyday encounter
- Simons, Christine,Naylor,Belinda: Effective Communication for Managers,1997 1st Edition Cassell
- Harvard Business School, Effective Communication: United States of America
- Beebe, Beebe and Redmond; Interpersonal Communication, 1996; Allyn and Bacon Publishers.

FRENCH

CODE	L	T	P/FW	CREDITS	Semester
FLT 211	2	-	-	2	1

Course Learning Outcomes:

CLO1. Identify and express in French vocabulary and grammar norms
CLO2. Interpret different types of texts as well as cultural ideas and themes.
CLO3. Demonstrate comprehension of nuance between script and sound in French
CLO4. Narrate clearly ideas, themes in simple standard French

Course Objective:

- To enable the students to overcome the fear of speaking a foreign language and take position as a foreigner speaking French.
- To make them learn the basic rules of French Grammar.

Course Contents:

Module A: pp.38 – 47: Unité 3: Objectif 3, 4, 5. 6

Module B: pp. 47 to 75 Unité 4, 5

Contenu lexical: **Unité 3: Organiser son temps**

1. donner/demander des informations sur un emploi du temps, un horaire SNCF – Imaginer un dialogue
2. rédiger un message/ une lettre pour …

i) prendre un rendez-vous/ accepter et confirmer/ annuler

ii) inviter/accepter/refuser

3. Faire un programme d'activités

imaginer une conversation téléphonique/un dialogue

Propositions- interroger, répondre

Unité 4: **Découvrir son environnement**

1. situer un lieu
2. s'orienter, s'informer sur un itinéraire.
3. Chercher, décrire un logement
4. connaître les rythmes de la vie

Unité 5: s'informer

1. demander/donner des informations sur un emploi du temps passé.
2. donner une explication, exprimer le doute ou la certitude.
3. découvrir les relations entre les mots
4. savoir s'informer

Contenu grammatical:

1. Adjectifs démonstratifs
2. Adjectifs possessifs/exprimer la possession à l'aide de:
   i. « de » ii. A+nom/pronom disjoint
3. Conjugaison pronominale – négative, interrogative - construction à l'infinitif
4. Impératif/exprimer l'obligation/l'interdiction à l'aide de « il faut…. »/ «il ne faut pas… »
5. passé composé
6. Questions directes/indirectes

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- **le livre à suivre: Campus: Tome 1**

GERMAN

CODE	L	T	P/FW	CREDITS	Semester
FLG 211	2	-	-	2	1

Course Learning Outcomes:

1. understand and give instructions
2. understand and reply to a letter
3. speak about learning languages
4. find a particular information in a text
5. understand a conversation

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany
Introduction to Grammar to consolidate the language base learnt in Semester I

Course Contents:

Module I: Everything about Time and Time periods
Time and times of the day.
Weekdays, months, seasons.
Adverbs of time and time related prepositions

Module II: Irregular verbs
Introduction to irregular verbs like to be, and others, to learn the conjugations of the same, (fahren, essen, lessen, schlafen, sprechen und ähnliche).

Module III: Separable verbs
To comprehend the change in meaning that the verbs undergo when used as such
Treatment of such verbs with separable prefixes

Module IV: Reading and comprehension
Reading and deciphering railway schedules/school time table
Usage of separable verbs in the above context

Module V: Accusative case
Accusative case with the relevant articles
Introduction to 2 different kinds of sentences – Nominative and Accusative

Module VI: Accusative personal pronouns
Nominative and accusative in comparison
Emphasizing on the universal applicability of the pronouns to both persons and objects

Module VII: Accusative prepositions
Accusative propositions with their use
Both theoretical and figurative use

Module VIII: Dialogues
Dialogue reading: 'In the market place'
'At the Hotel'

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH

CODE	L	T	P/FW	CREDITS	Semester
FLS 211	2	-	-	2	1

Course Learning outcomes:

1. Identify and express in Spanish vocabulary and grammar norms
2. Interpret different types of texts as well as cultural ideas and themes.
3. Demonstrate comprehension of nuance between script and sound in Spanish
4. Narrate clearly ideas, themes in simple standard Spanish

Course Objective:

To enable students acquire more vocabulary, grammar, verbal phrases to understand simple texts and start describing any person or object in Simple Present Tense.

Course Contents:

Module I

Revision of earlier modules.

Module II

Some more AR/ER/IR verbs. Introduction to root changing and irregular AR/ER/IR ending verbs

Module III

More verbal phrases (eg, Dios Mio, Que lastima etc), adverbs *(bueno/malo, muy, mucho, bastante, poco).*

Simple texts based on grammar and vocabulary done in earlier modules.

Module IV

Possessive pronouns

Module V

Writing/speaking essays like my friend, my house, my school/institution, myself….descriptions of people, objects etc, computer/internet related vocabulary

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras

CHINESE

CODE	L	T	P/FW	CREDITS	Semester
FLC 211	2	-	-	2	1

Course Learning Outcomes:

1. Read, write and speak approx. 100New Chinesewords and understand basic grammar points.
2. Interpretwords, phrases and sentences of Greetings, personal information like self-introduction, family, Hobbies, abilities Expression of gratitude apology etc .
3. Write Chinesecharacters, simple sentence and a paragraph on Greetings, personal information like self-introduction, family, Hobbies, abilities Expression of gratitude apology etc

Course Objective:

Chinese is a tonal language where each syllable in isolation has its definite tone (flat, falling, rising and rising/falling), and same syllables with different tones mean different things. When you say, "ma" with a third tone, it mean horse and "ma" with the first tone is Mother. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I

Drills
Practice reading aloud
Observe Picture and answer the question.
Tone practice.
Practice using the language both by speaking and by taking notes.
Introduction of basic sentence patterns.
Measure words.
Glad to meet you.

Module II

Where do you live?
Learning different colors.
Tones of "bu"
Buying things and how muchit costs?
Dialogue on change of Money.
More sentence patterns on Days and Weekdays.
How to tell time. Saying the units of time in Chinese. Learning to say useful phrases like – 8:00, 11:25, 10:30 P.M. everyday, afternoon, evening, night, morning 3:58, one hour, to begin, to end ….. etc.
Morning, Afternoon, Evening, Night.

Module III

Use of words of location like-li, wais hang, xia
Furniture – table, chair, bed, bookshelf,.. etc.
Description of room, house or hostel room.. eg what is placed where and how many things are there in it?
Review Lessons – Preview Lessons.

Expression ‘yao”, “xiang” and “yaoshi” (if).
Days of week, months in a year etc.
I am learning Chinese. Is Chinese difficult?

Module IV
Counting from 1-1000
Use of “chang-chang”.
Making an Inquiry – What time is it now? Where is the Post Office?
Days of the week. Months in a year.
Use of Preposition – “zai”, “gen”.
Use of interrogative pronoun – “duoshao” and “ji”.
“Whose”??? Sweater etc is it?
Different Games and going out for exercise in the morning.

Module V
The verb “qu”
Going to the library issuing a book from the library
Going to the cinema hall, buying tickets
Going to the post office, buying stamps
Going to the market to buy things.. etc
Going to the buy clothes …. Etc.
Hobby. I also like swimming.
Comprehension and answer questions based on it.

Examination Scheme:

Components	**CT1**	**CT2**	**C**	**I**	**V**	**A**
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- “Elementary Chinese Reader Part I” Lesson 11

OPTIMIZATION TECHNIQUES

Course Code	L	T	P/FW	Credits	Semester
MDS301	2	1	-	3	3

Course Learning Outcomes:

CLO1: Learn classical optimization techniques and numerical methods of optimization.
CLO2: Know the basics of different evolutionary algorithms.
CLO3: Explain Integer programming techniques and apply different optimization techniques to solve various models arising from engineering areas.

Course Contents:

Module I: Introduction of OR and Linear Programming

Basic Deification, Nature and Significance of OR, feature of OR Approach Application and Scope of OR, General Methods for Solving Or Models. General Structure of Linear Programming, Advantages and Limitations of Linear Programming, Application Areas of Linear Programming.

Linear Programming Solutions: Mathematical formulation of LPP, Standard form of LPP, Multiple Solution, Unbounded Solutions, Infeasible Solution of LPP.

Module II: Simplex Method

Maximization and Minimization Problem, Solution of LPP using Graphical method, Simplex Method, two Phase Method, Big M Method.

Module III: Duality in LPP

Dual Linear Programming Problem, Rules for Constructing the Dual from Primal, Feature of Duality

Module IV: Transportation Problem

Mathematical Model of Transportation Problem, Transportation Method, North West Corner Method, Linear Cost Method, Vogel's Approximation Method, Unbalanced Supply and Demand, Degeneracy Problem, Alternative Optional Solution, Maximization Transportation Problem..

Module V: Queueing Models

Markovian queues – Birth and Death processes – Single and multiple server queueing models (M/M/1 & M/M/S) – Little"s formula – Queues with finite waiting rooms – Queues with impatient customers: Balking and reneging.

Module VI: Theory of Games

Two Person Zero-Sum Games, Pure Strategies, Game with Saddle Point, Games without Saddle Point, Rule of Dominance, Methods for Solving Problems without Saddle Point.

Module VII: Project Management

Basic Idea of PERT & CRM, Difference between PERT & CPM, PERT/CPM Network Components and Precedence Relationship Critical Path Analysis, Project Scheduling, Project Time-Cost, Trade-Off, Resource Allocation.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Operations Research, J K Sharma, Macmillan Publication

References:

- Operations Research, H. A. Taha
- Operations Research, Kanti Swaroop, Macmillan Publication

MACHINE LEARNING AND DEEP LEARNING

Course Code	L	T	P/FW	Credits	Semester
MDS 302	2	1	-	3	3

Course Learning Outcomes:

CLO1: To introduce students to the basic concepts and techniques of Machine Learning.
CLO2: To develop skills of using recent machine learning software for solving practical problems.
CLO3:To gain experience of doing independent study and research.

Course Contents:

Module I: Regression, Classification and Clustering

Machine learning theory - ML vs. DL vs. AI – data preprocessing ; regression ; supervised learning techniques and un-supervised learning techniques (clustering) ; evaluation of models' performance; model selection; over-fitting, bagging and boosting, dimensionality reduction and feature selection. Bias - variance trade-off.

Module II: Deep Learning

Introduction to deep learning - neural network - binary classification - logistic regression - gradient descent - logistic regression gradient descent - deep net - the vanishing gradient problem - training a neural network

Module III: Model Tuning

Forward propagation in a deep network - forward and backward propagation - sigmoid vs. softmax - choosing learning rate and regularization penalty – grid search- parameters vs hyper-parameters; building an ANN;

Module IV – CNN

Basics of CNN ; convolution operation – ReLU – Pooling – flattening- full connection- softmax and cross-entrophy – building a CNN – Dimensionality Reduction- Principal Component Analysis - Linear Discriminant Analysis

Module IV – RNN

Basics of RNN; building a RNN - Vanishing Gradient Problem – Model Selection & Boosting - k-Fold Cross Validation - Grid Search - LSTMs

Examination Components

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text Books and References:

1. E. Alpaydin, Introduction to Machine Learning, Prentice Hall of India, 2006.

2. Tom M. Mitchell, Machine Learning, Mc Graw Hill, 2017

3. C. M. Bishop, Pattern Recognition and Machine Learning, Springer, 2010.

5. Simon O. Haykin, Neural Networks and Learning Machines, Pearson Education, 2016

NATURAL LANGUAGE PROCESSING

Course Code	L	T	P/FW	Credits	Semester
MDS303	2	1	-	3	3

Course Learning Outcomes:

CLO1: Use NLP technologies to explore and gain a broad understanding of text data.
CLO2: Use NLP methods to analyse sentiment of a text document.
CLO3: Use NLP methods to perform topic modelling.
CLO4: Organise and implement a NLP project in a business environment.

Course Contents

Module-I
Natural Language Processing, it importance and its significance now, Natural Language Processing Workflow (Lexical Analysis, Parsing, Semantic Analysis, Discourse Integration, Pragmatic Analysis), Components of NLP, Natural Language Understanding (analyzing, mapping), Natural Language Generation (Text planning, Sentence planning, Text Realization), Challenge of ambiguity

Module-II
Different data sources of Natural Language Processing, Natural Language Processing tools and packages, Social media data analysis (Twitter analysis), create Twitter Application development account, Various Twitter analysis package in R. Unwanted data in tweets, and social media posts. Understanding the psychology of the social media user.

Module-III
Sentiment analysis and behavioral analysis, NLP and Writing Systems, Implement NLP using machine learning and Statistic, Information retrieval & Web Search using NLP, Google, Yahoo, Bing, and other search engines base their machine translation technology on NLP machine learning models. Machine learning for reading text on a webpage, interpret its meaning and translate it to another language.

Module-IV
Document processing (word, pdf files, etc). Various R packages used for document processing. Reading and analyzing a document. Differentiating between various documents automatically with the help of machine learning. Visualizing the analyzed document results.

Module-V
Two real world Natural Language Processing case studies

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text and References:

- Julia Sigie. Text Mining with R: A Tidy Approach 1st Edition. O'Rielley Publications

MACHINE LEARNING AND DEEP LEARNING LAB

Course Code	L	T	P/FW	Credits	Semester
MDS322	-	-	2	1	3

Course Learning Outcomes:

CLO1: To introduce students to the basic concepts and techniques of Machine Learning.
CLO2: To develop skills of using recent machine learning software for solving practical problems.
CLO3: To gain experience of doing independent study and research.

List of Programmes:

1. To implement regression on any data set.
2. To apply few supervised learning algorithms to perform classification.
3. Apply different model evaluation techniques on above problem.
4. To apply few un-supervised learning algorithms to perform clustering.
5. Apply different model evaluation techniques on above problem.
6. To implement a dimensionality reduction technique on a suitable dataset.
7. To show bias- variance trade off graphically on any suitable dataset.
8. To perfrom binary classification using NN.
9. To perform logistic regression using NN.
10. To show the use of a sigmoid functions on dataset.
11. To show the use of a softmax functions on dataset.
12. Use grid search and hyper-parameter tuning on a NN.
13. To show the use of a ReLU functions on dataset.
14. To build/ train- test a CNN.
15. To show the use of PCA/ LDA on a dataset.
16. To build a RNN model
17. Implementing an LSTM

NATURAL LANGUAGE PROCESSING LAB

Course Code	L	T	P/FW	Credits	Semester
MDS323	-	-	2	1	1

Course Learning Outcomes:

CLO1: Use NLP technologies to explore and gain a broad understanding of text data.
CLO2Use NLP methods to analyse sentiment of a text document.
CLO3:Use NLP methods to perform topic modelling. Organise and implement a NLP project in a business environment.

Experiments

1. Make twitter app development account and activate it
2. Download tweets and #hastag data,
3. Clean tweet and write in a dataframe
4. Write R code to perform sentiment analysis of tweets dataset 1
5. Write R code to perform sentiment analysis of tweets dataset 1
6. Write R code, predicted sentiments from the tweeter dataset
7. Read documents such as word files, pdf files, etc
8. Design a document matrix
9. Count frequency of specific words in the documents

BIG DATA FOR MANAGERS

Course Code	L	T	P/FW	Credits
MDS331	2	1	-	3

ARTIFICIAL INTELLIGENCE

Course Code	L	T	P/FW	Credits	Semester
MDS333	2	1	-	3	3

Course Learning Outcomes:

CLO1: AI is an introductory course in Artificial Intelligence.
CLO2: The goal is to acquire knowledge on intelligent systems and agents, formalization of knowledge.
CLO3, reasoning with and without uncertainty, machine learning and applications at a basic level.

Course Contents:

Module I: Introduction

AI and its importance, AI Problem, Application area.

Module II: Problem Representations

State space representation, problem-reduction representation, production system, production system characteristics, and types of production system.

Module III: Heuristic Search Techniques

AI and search process, brute force search, depth-first search, breadth-first search, time and space complexities, heuristics search, hill climbing, best first search, A*, AO* algorithm, constraint satisfaction, and beam search.

Module IV: Knowledge Representation issues using predicate logic

Representation and mapping, knowledge representation mechanism, inheritable knowledge, Prepositional logic: syntax and semantics, First Order Predicate Logic (FOPL).

Module V: Expert System

Basic understanding of Fuzzy Logic, Artificial Neural Network, Perceptron, Natural Language Processing, Pattern Recognition, Robotics, LISP and Prolog. The role of Artificial intelligence in Biotechnology. Introduction to Bio-inspired computing.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Artificial Intelligence – II Edition, Elaine Rich, Kevin Knight TMH.

References:

- Foundations of Artificial Intelligence and Expert Systems, V S Janakiraman, K Sarukesi, P Gopalakrishan, Macmillan India Ltd.
- Introduction to AI and Expert System, Dan W. Patterson, PHI.

BIG DATA & ANALYTICS USING R

Course Code	L	T	P/FW	Credits	Semester
MDS334	2	1	-	3	3

Course Learning Outcomes:

CLO1: Knowledge acquired: Students will get to know (1) fundamental statistical concepts and some of their basic applications in real world.
CLO2(2) organizing, managing, and presenting data,
CLO(3) how to use a wide variety of specific statistical methods, and,
CLO(4) computer programming in R.

Course Contents

Module-I

Introduction to Big Data & Big Data Challenges Preview, Limitations & Solutions of Big Data Architecture, Bigdata Concepts, Bigdata sources, climate data, multimedia data, social media data, youtube data, etc., and bigdata tools and platforms.

Module-II

Introduction to Hadoop, Apache, Pig, Hive, Flume, Sqoop, Zookeeper, Oozie, Spark, SAP HANA, Microsoft Azure, Cassandra, MongoDB, Google Big Query, Cloudera. Comparison between Hadoop, Spark, Cassandra, Mongo DB, etc., Parallel and distributive computing, their advantages and disadvantages, and differences.

Module-III

Big data strategies: Sample and Model, Chunk and Pull, Push Compute to Data. Hadoop and its elements, Hadoop distributed file system (HDFS) and its operations, HBase, Mapreduce (Splitter, Mapper , Shuffle, Reducer), Pig, Hive, YARN, R and Hadoop Integrated Programming Environment (RHIPE), Open source package RHadoop.

Module-IV

Tricks to handle Bigdata in R, Minimize copies of data, Process data in chunks, Compute in parallel, Leverage integers, Use efficient file formats and data types, Load only data you need, Minimize loops, Memory cleanup, R object deletion after usage.

Module-V

3 Real world case studies

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text and References:

- Simon Walkowiak, Big Data Analytics with R, Packt Publishing. (2016)
- Benjamin Bengfort and Jenny Kim., Data Analytics with Hadoop: An Introduction for Data Scientists 1st Edition. O'Reilley Publication.

ARTIFICIAL INTELLIGENCE LAB

Course Code	L	T	P/FW	Credits	Semester
MDS343	-	-	2	1	3

Course Learning outcomes:

CLO1: AI is an introductory course in Artificial Intelligence.
CLO2: The goal is to acquire knowledge on intelligent systems and agents, formalization of knowledge, reasoning with and without uncertainty
CLO3, machine learning and applications at a basic level.

LIST OF PROGRAMS

1. Write a program to solve 8 queens problem
2. Solve any problem using depth first search.
3. Solve any problem using best first search.
4. Solve 8-puzzle problem using best first search
5. Solve Robot (traversal) problem using means End Analysis
6. Solve traveling salesman problem.

Books for Reference :

- Artificial Intelligence: A Modern Approach,. Russell & Norvig. 1995, Prentice Hall.
- Artificial Intelligence, Elain Rich and Kevin Knight, 1991, TMH.
- Artificial Intelligence-A modern approach, Staurt Russel and peter norvig, 1998, PHI.
- Artificial intelligence, Patrick Henry Winston:, 1992, Addition Wesley 3 Ed.,
- Introduction to prolog.

Examination Scheme:

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

BIG DATA & ANALYTICS USING R LAB

Course Code	L	T	P/FW	Credits	Semester
MDS344	-	-	2	1	1

Course Learning Outcomes:

CLO (1) fundamental statistical concepts and some of their basic applications in real world.
CLO (2) organizing, managing, and presenting data,
CLO(3) how to use a wide variety of specific statistical methods, and,
CLO4(4) computer programming in R.

Lab Experiments

1. Install and Read files using Hadoop
2. Perform various queries using pig and hive in Hadoop
3. Create Database & Collection in MongoDB
4. Write R program to reduce size of data by manipulating datatypes
5. Write R program to reduce size of data by removing insignificant data
6. Write R program to reduce memory usage by using memory efficiently

MINOR PROJECT

Course Code	L	T	P	Credit
MDS 350	-	-	-	4

GUIDELINES FOR PROJECT FILE

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation.

Research is genuine exploration of the unknown that leads to new knowledge, which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals.
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

Report Layout

The report should contain the following components

1. File should be in the following specification

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components

Front Page
Table of Contents
Acknowledgement
Student Certificate
Company Profile
Introduction
Chapters
Appendices
References / Bibliography

- **Title or Cover Page or Front Page**

The title page should contain the following information: Project Title; Student's Name; Course; Year; Supervisor's Name.

- **Table of Contents**

Titles and subtitles are to correspond exactly with those in the text.

- **Acknowledgement**

Acknowledgment to any advisory or financial assistance received in the course of work may be given.

- **Student Certificate**

Given by the Institute.

- **Company Certificate & Profile**

This is a certificate, which the company gives to the students. A Company Profile corresponds to a file with company-specific data. Company data can be stored there and included in a booking when needed.

- **Introduction**

Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

- **Chapters**

All chapters and sections must be appropriately numbered, titled and should neither be too long nor too short in length.

The first chapter should be introductory in nature and should outline the background of the

project, the problem being solved, the importance, other related works and literature survey.

The other chapters would form the body of the report. The last chapter should be concluding

in nature and should also discuss the future prospect of the project.

- **Appendices**

The Appendix contains material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

- **References / Bibliography**

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project. Project execution is concerned with assessing how much work has been put in.

The File should fulfill the following ***assessment objectives:***

1. Writing a critical literature review
    - Search for literature
    - Summarizing and presenting the literature
    - Evaluating key content and theories

2. Collecting and analyzing research material
    - Choosing and designing research method
    - Conducting the research
    - Analyzing, sorting and classifying the data to make decision

3. Interpreting research method and draw conclusion
    - Findings
    - Recommendation

4. Assigning the theories and writing the project report
    - Structuring the project in accordance with the given style

5. Bibliography
    - This refer to the books, Journals and other documents consulting while working on the project

Examination Scheme:

Components	**MRP**	**V**	**S**	**FP**	**R**
Weightage (%)	20	20	20	20	20

MRP – Mid Report Presentation, V – Viva, S – Synopsis, FP – Final Presentation, R - Report

REPORT ON PAPER PRESENTATION IN CONFERENCE

Course Code	L	T	P	Credit
MDS 351	-	-	-	1

Objective: Conferences / Seminars / Workshop are good and efficient way to get to know other researchers through their work and also personally. The educational aspect can expose the students to new ways of conducting the business and help them to discover how to be more productive. They provide a great opportunity to network. Collaboration is the way to approach networking.

Rules and Regulations

- 2nd Year / 3rd Year Students for which the students and the faculty members can start preparations well in advance prior to the scheduled conference / seminar / workshop.
- The number of students going for any conference / seminar / workshop should be manageable.
- A proposal for the proposed conference / seminar / workshop should be drafted and presented to the HoI reflecting the following key points:
    - Entire activity plan
    - Route Map
    - What are the objectives for the students?
    - What they need to learn, do, and prepare before the conference / seminar / workshop?
    - List of prospective students with Contact Details
    - List of Faculty Coordinators with Contact Details
- After getting approval from the HoI, a note sheet should be prepared and all necessary permission and approval from the competent authorities should be obtained.
- The attention and co-operation of all students and parents are requested to attend the conference / seminar / workshop most effectively. Signing of the letter of Indemnity Bond (Consent-cum-Undertaking) is mandatory for all the parents of students going for conference / seminar / workshop in or outside Jaipur. Duly executed Indemnity Bond should be submitted to HoI Office at least 2 days prior to the visit, without which the accompanying Staff coordinator shall not permit the student to participate in the industrial visit
- The list of students participating in conference / seminar / workshop shall be handed over to the concerned HODs, Staff coordinators.
- Students should be present in formals.
- Students should carry the College Identity Cards during their journey.
- Discipline should be maintained during the conference / seminar / workshop. Any violation will be viewed very seriously.
- A report of the conference / seminar / workshop is to be submitted in 5 days time by students / faculty coordinators once the students are back.

The report to be prepared should reflect the following:-

- What happened at the conference / seminar / workshop the students attend and how does it relate in the best way to the preparations and the learning objectives.
- How do the students will use the outcome of conference / seminar / workshop after it is over?
- What will they gain from it and how can they set up activities that transfer the experience into learning?

- Evaluation parameters for the success of the experience of conference / seminar / workshop.

The layout guidelines for the Report:

1. File should be in the following specification:

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components:

- Front Page
- Table of Content
- Acknowledgement
- Student Certificate
- Company Profile (optional)
- Introduction
- Main Body
- References / Bibliography

ASSESSMENT OF THE PAPER PRESENTATION FILE

The student will be provided with the Student Assessment Record (SAR) to be placed in front of the Report File. Each item in the SAR is ticked off when it is completed successfully. The faculty will also assess each item as it is completed. The SAR will be signed by the student and by the faculty to indicate that the File is the student's own work. It will also ensure regularity and meeting the delaines.

Examination Scheme:

Components	**V**	**S**	**R**	**FP**
Weightage (%)	20	20	20	40

V – Viva, S – Synopsis, FP – Final Presentation, R - Report

SUMMER INTERNSHIP PROJECT

Course Code	L	T	P	Credit
MDS 352	-	-	-	3

GUIDELINES:

There are certain phases of every Intern's professional development that cannot be effectively taught in the academic environment. These facets can only be learned through direct, on-the-job experience working with successful professionals and experts in the field. The internship program can best be described as an attempt to institutionalize efforts to bridge the gap between the professional world and the academic institutions. Entire effort in internship is in terms of extending the program of education and evaluation beyond the classroom of a university or institution. The educational process in the internship course seeks out and focuses attention on many latent attributes, which do not surface in the normal classroom situations. These attributes are intellectual ability, professional judgment and decision-making ability, inter-disciplinary approach, skills for data handling, ability in written and oral presentation, sense of responsibility etc.

In order to achieve these objectives, each student will maintain a file (**Internship File**). The Internship File aims to encourage students to keep a personal record of their learning and achievement throughout the Programme. It can be used as the basis for lifelong learning and for job applications. Items can be drawn from activities completed in the course modules and from the workplace to demonstrate learning and personal development.

The File will assess the student's analytical skills and ability to present supportive evidence, whilst demonstrating understanding of their organization, its needs and their own personal contribution to the organization.

The **layout guidelines** for the Project & Seminar Report

1. File should be in the following specification

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components

Front Page
Table of Content
Acknowledgement
Student Certificate
Company Profile (optional)
Introduction
Main Body
References / Bibliography

The File will include ***five sections*** in the order described below. The content and comprehensiveness of the main body and appendices of the report should include the following:

1. **The Title Page**--Title - An Internship Experience Report For (Your Name), name of internship organization, name of the Supervisor/Guide and his/her designation, date started and completed, and number of credits for which the report is submitted.
2. **Table of Content**--an outline of the contents by topics and subtopics with the page number and location of each section.
3. **Introduction**--short, but should include how and why you obtained the internship experience position and the relationship it has to your professional and career goals.
4. **Main Body**--should include but not be limited to daily tasks performed. Major projects contributed to, dates, hours on task, observations and feelings, meetings attended and their purposes, listing of tools and materials and their suppliers, and photographs if possible of projects, buildings and co-workers.
5. **References / Bibliography** --This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system

ASSESSMENT OF THE INTERNSHIP FILE

The student will be provided with the Student Assessment Record (SAR) to be placed in front of the Internship File. Each item in the SAR is ticked off when it is completed successfully. The faculty will also assess each item as it is completed. The SAR will be signed by the student and by the faculty to indicate that the File is the student's own work. It will also ensure regularity and meeting the delaines.

STUDENT ASSESSMENT RECORD (SAR)

1. Range of Research Methods used to obtain information

2. Execution of Research

3. Data Analysis
- Analyse Quantitative/ Qualitative information
- Control Quality

4. Draw Conclusions

Examination Scheme:

Components	**V**	**S**	**R**	**FP**
Weightage (%)	20	20	20	40

V – Viva, S – Synopsis, FP – Final Presentation, R - Report

Course Title: Anandam

Type: Compulsory

Semester III

Course Code:AND003 **Credit Units: 02**

Course Learning Outcomes:

The student should develop:

- Awareness and empathy regarding community issues
- Interaction with the community and impact on society
- Interaction with mentor and development of Student teacher relationship
- Interaction among students, enlarge social network
- Cooperative and Communication skills and leadership qualities
- Critical thinking, Confidence and Efficiency

Course Objectives:

After the completion of this course, students will be able to:

- apply their knowledge and skills to solve specific community problem
- learn to plan, lead, and organize community events have a sense of belonging to their college campus and community and find something they are interested in doing during their free time
- make new friends, expand social network, and boost social skills and mental health.
- be useful to society as it will protect them against stress, frustration, and depression

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants,phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.
- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.
3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
6. For the topic chosen by the group, students are recommended to cover the following points:
    a) Current scenario (Regional, national and international level as applicable)
    b) Future predictions
    c) Duty of the government
    d) Government policies (related to the topic), if any
    e) Duty of public
    f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
3. Conclusion is clearly stated. The underlying logic is explicit.

COMMUNICATION SKILLS-III

CODE	L	T	P/FW	CREDITS	Semester
BCS311	1	-	-	1	3

Course Learning Outcomes:

CLO1: Investigate their personal strengths and insights to be revealed in a Formal Setup of Communication.

CLO2. Create right selection of words and ideas while choosing the appropriate channel of formal communication

CLO3. Apply acquired knowledge with the appropriate selection of channel of formal communication.

CLO4. Develop and empower self with the ease of using appropriate medium of communication.

Course Objective:

To initiate the learners with the basic mechanics of writing skills and facilitate them with the core skills required for communication in the professional world.

Course Contents:

Module I: Mechanics and Semantics of Sentences

Writing effective sentences
Style and Structure

Module II: Developing writing skills

Inter - office communication: Business Letter; E mails; Netiquette
Intra – office communication: Memos, Notices, Circulars, Minutes
Report Writing

Module III: Business Presentations

Planning, design and layout of presentation
Information Packaging
Audience analysis
Audio visual aids
Speaking with confidence
Case Studies

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A
Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Krishnaswamy, N, Creative English for Communication, Macmillan
- Raman Prakash, Business Communication, Oxford.

BEHAVIOURAL SCIENCE-III (Leading Through Teams)

CODE	L	T	P/FW	CREDITS	Semester
BSS311	1	-	-	1	3

Course Learning Outcomes:

CLO1: Demonstrate knowledge of strategies for developing a healthy interpersonal communication

CLO2: Recognize the importance of transactional analysis, script analysis
CLO3: Identify the difference between healthy and unhealthy expression of emotions and develop emotional competencenecessary for conflict resolution and impression management.

CLO4: Demonstrate knowledge of strategies for developing a healthy interpersonal relationship

Course Objective:

This course aims to enable students to:
Understand the concept and building of teams
Manage conflict and stress within team
Facilitate better team management and organizational effectiveness through universal human values.

Course Contents:

Module I: Teams: An Overview

Team Design Features: team vs. group
Effective Team Mission and Vision
Life Cycle of a Project Team
Rationale of a Team, Goal Analysis and Team Roles

Module II: Team & Sociometry

Patterns of Interaction in a Team
Sociometry: Method of studying attractions and repulsions in groups
Construction of sociogram for studying interpersonal relations in a Team

Module III: Team Building

Types and Development of Team Building
Stages of team growth
Team performance curve
Profiling your Team: Internal & External Dynamics
Team Strategies for organizational vision
Team communication

Module IV: Team Leadership & Conflict Management

Leadership styles in organizations
Self Authorized team leadership
Causes of team conflict
Conflict management strategies
Stress and Coping in teams

Module V: Global Teams and Universal Values

Management by values

Pragmatic spirituality in life and organization

Building global teams through universal human values

Learning based on project work on Scriptures like Ramayana, Mahabharata, Gita etc.

Module VI: End-of-Semester Appraisal

Viva based on personal journal

Assessment of Behavioural change as a result of training

Exit Level Rating by Self and Observer

Examination Scheme:

Components	**SAP**	**A**	**Mid Term Test (CT)**	**VIVA**	**Journal for Success (JOS)**
Weightage (%)	20	05	20	30	25

Text & References:

- Organizational Behaviour, Davis, K.
- Hoover, Judhith D. Effective Small Group and Team Communication, 2002,Harcourt College Publishers
- LaFasto and Larson: When Teams Work Best, 2001, Response Books (Sage), New Delhi
- Dick, Mc Cann & Margerison, Charles: Team Management, 1992 Edition, viva books
- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer & Company
- Smither Robert D.; The Psychology of Work and Human Performance, 1994, Harper Collins College Publishers

FRENCH

CODE	L	T	P/FW	CREDITS	Semester
FLT 311	2	-	-	2	1

Course Learning Outcomes:

CLO1. Identify and express in French vocabulary and grammar norms
CLO2. Interpret different types of texts as well as cultural ideas and themes.
CLO3. Demonstrate comprehension of nuance between script and sound in French
CLO4. Narrate clearly ideas, themes in simple standard French

Course Objective:

To provide the students with the know-how

- To master the current social communication skills in oral and in written.
- To enrich the formulations, the linguistic tools and vary the sentence construction without repetition.

Course Contents:

Module B: pp. 76 – 88 Unité 6

Module C: pp. 89 to103 Unité 7

Contenu lexical: **Unité 6: se faire plaisir**

1. acheter: exprimer ses choix, décrire un objet (forme, dimension, poids et matières) payer
2. parler de la nourriture, deux façons d'exprimer la quantité, commander un repas au restaurant
3. parler des différentes occasions de faire la fête

Unité 7: Cultiver ses relations

maîtriser les actes de la communication sociale courante (Salutations, présentations, invitations, remerciements)
annoncer un événement, exprimer un souhait, remercier, s'excuser par écrit.
caractériser une personne (aspect physique et caractère)

Contenu grammatical:

1. accord des adjectifs qualificatifs
2. articles partitifs
3. Négations avec de, ne…rien/personne/plus
4. Questions avec combien, quel…
5. expressions de la quantité
6. ne…plus/toujours - encore
7. pronoms compléments directs et indirects
8. accord du participe passé (auxiliaire « avoir ») avec l'objet direct
9. Impératif avec un pronom complément direct ou indirect
10. construction avec « que » - Je crois que/ Je pense que/ Je sais que

Examination Scheme:

Components	CT1	CT2	C	I	V	A

Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1

GERMAN

CODE	L	T	P/FW	CREDITS	Semester
FLG 311	2	-	-	2	3

Course Learning Outcomes:

1. understand and give instructions
2. understand and reply to a letter
3. speak about learning languages
4. find a particular information in a text
5. understand a conversation

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.

To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany

Course Contents:

Module I: Modal verbs

Modal verbs with conjugations and usage

Imparting the finer nuances of the language

Module II: Information about Germany (ongoing)

Information about Germany in the form of presentations or "Referat"– neighbors, states and capitals, important cities and towns and characteristic features of the same, and also a few other topics related to Germany.

Module III: Dative case

Dative case, comparison with accusative case

Dative case with the relevant articles

Introduction to 3 different kinds of sentences – nominative, accusative and dative

Module IV: Dative personal pronouns

Nominative, accusative and dative pronouns in comparison

Module V: Dative prepositions

Dative preposition with their usage both theoretical and figurative use

Module VI: Dialogues

In the Restaurant,

At the Tourist Information Office,

A telephone conversation

Module VII: Directions

Names of the directions

Asking and telling the directions with the help of a roadmap

Module VIII: Conjunctions

To assimilate the knowledge of the conjunctions learnt indirectly so far

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH

CODE	L	T	P/FW	CREDITS	Semester
FLS 311	2	-	-	2	3

Course Learning Outcomes:

1. Identify and express in Spanish vocabulary and grammar norms
2. Interpret different types of texts as well as cultural ideas and themes.
3. Demonstrate comprehension of nuance between script and sound in Spanish
4. Narrate clearly ideas, themes in simple standard Spanish

Course Objective:

To enable students acquire knowledge of the Set/definite expressions (idiomatic expressions) in Spanish language and to handle some Spanish situations with ease.

Course Contents:

Module I

Revision of earlier semester modules
Set expressions (idiomatic expressions) with the verb *Tener, Poner, Ir….*
Weather

Module II

Introduction to *Gustar*…and all its forms. Revision of *Gustar* and usage of it

Module III

Translation of Spanish-English; English-Spanish. Practice sentences.
How to ask for directions (using estar)
Introduction to IR + A + INFINITIVE FORM OF A VERB

Module IV

Simple conversation with help of texts and vocabulary
En el restaurante
En el instituto
En el aeropuerto

Module V

Reflexives

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A

- Español Sin Fronteras -Nivel Elemental

CHINESE

CODE	L	T	P/FW	CREDITS	Semester
FLC 311	2	-	-	2	3

Course Learning Outcomes:

1. Read, write and speak approx. 100New Chinesewords and understand basic grammar points.
2. Interpretwords, phrases and sentences of Greetings, personal information like self-introduction, family, Hobbies, abilities Expression of gratitude apology etc .
3. Write Chinesecharacters, simple sentence and a paragraph on Greetings, personal information like self-introduction, family, Hobbies, abilities Expression of gratitude apology etc

Course Objective:

Foreign words are usually imported by translating the concept into Chinese, the emphasis is on the meaning rather than the sound. But the system runs into a problem because the underlying name of personal name is often obscure so they are almost always transcribed according to their pronciation alone. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I

Drills
Dialogue practice
Observe picture and answer the question.
Introduction of written characters.
Practice reading aloud
Practice using the language both by speaking and by taking notes.
Character writing and stroke order

Module II

Measure words
Position words e.g. inside, outside, middle, in front, behind, top, bottom, side, left, right, straight.
Directional words – beibian, xibian, nanbian, dongbian, zhongjian.
Our school and its different building locations.
What game do you like?
Difference between “hii” and “neng”, “keyi”.

Module III

Changing affirmative sentences to negative ones and vice versa
Human body parts.
Not feeling well words e.g.; fever, cold, stomach ache, head ache.
Use of the modal particle “le”
Making a telephone call
Use of “jiu” and “cal” (Grammar portion)
Automobiles e.g. Bus, train, boat, car, bike etc.

Traveling, by train, by airplane, by bus, on the bike, by boat.. etc.

Module IV

The ordinal number "di"
"Mei" the demonstrative pronoun e.g. mei tian, mei nian etc.
use of to enter to exit
Structural particle "de" (Compliment of degree).
Going to the Park.
Description about class schedule during a week in school.
Grammar use of "li" and "cong".
Comprehension reading followed by questions.

Module V

Persuasion-Please don't smoke.
Please speak slowly
Praise – This pictorial is very beautiful
Opposites e.g. Clean-Dirty, Little-More, Old-New, Young-Old, Easy-Difficult, Boy-Girl, Black-White, Big-Small, Slow-Fast … etc.
Talking about studies and classmates
Use of "it doesn't matter"
Enquiring about a student, description about study method.
Grammar: Negation of a sentence with a verbal predicate.

Examination Scheme:

Components	**CT1**	**CT2**	**C**	**I**	**V**	**A**
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- "Elementary Chinese Reader Part I, Part-2" Lesson 21-30

PROJECT WORK

Course Code	L	T	P	Credit
MDS460	-	-	-	25

GUIDELINES FOR PROJECT FILE

The end semester evaluation of the project work will be based on the report and a Viva-Voce Examination by a team consisting of the Faculty Guide and External Examiner(s) who are appointed depending on the chosen areas of specialization of the students. **The duration of fast track examination is 3 months and then student will allow to take 3 month project work as it will give students exposure for practical aspect and satisfactory completion of project work should be critiqued by the faculty guide and corrected by the student.**

In general, the File should be comprehensive and include

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals.
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

Report Layout

The report should contain the following components

1. File should be in the following specification

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components

Front Page
Table of Contents
Acknowledgement
Student Certificate
Company Profile
Introduction
Chapters
Appendices
References / Bibliography

- **Title or Cover Page or Front Page**

The title page should contain the following information: Project Title; Student's Name; Course; Year; Supervisor's Name.

- **Table of Contents**

Titles and subtitles are to correspond exactly with those in the text.

- **Acknowledgement**

Acknowledgment to any advisory or financial assistance received in the course of work may be given.

- **Student Certificate**

Given by the Institute.

- **Company Certificate & Profile**

This is a certificate, which the company gives to the students. A Company Profile corresponds to a file with company-specific data. Company data can be stored there and included in a booking when needed.

- **Introduction**

Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

- **Chapters**

All chapters and sections must be appropriately numbered, titled and should neither be too long nor too short in length.

The first chapter should be introductory in nature and should outline the background of the project, the problem being solved, the importance, other related works and literature survey. The other chapters would form the body of the report. The last chapter should be concluding in nature and should also discuss the future prospect of the project.

- **Appendices**

The Appendix contains material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

- **References / Bibliography**

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based as per the examination Scheme given below :

Examination Scheme:

Components	**MRP**	**V**	**S**	**FP**	**R**
Weightage (%)	20	20	20	20	20

MRP – Mid Report Presentation, V – Viva, S – Synopsis, FP – Final Presentation, R - Report

INTERNSHIP

Course Code	L	T	P	Credit
MDS461	-	-	-	25

GUIDELINES FOR PROJECT FILE

The end semester evaluation of the internship will be based on the report and a Viva-Voce Examination by a team consisting of the guide and External Examiner(s) who are appointed depending on the chosen areas of specialization of the students. **The duration of fast track examination is 3 months and then student will allow to take 3 month internship as it will give students exposure to industry for practical scenario and satisfactory completion of internship taking into account that initial Report/Project file should be critiqued by the faculty guide and corrected by the student.**

In general, the File should be comprehensive and include

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals.
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

Report Layout

The report should contain the following components

1. File should be in the following specification

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
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- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components

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- **Title or Cover Page or Front Page**

The title page should contain the following information: Project Title; Student's Name; Course; Year; Supervisor's Name.

- **Table of Contents**

Titles and subtitles are to correspond exactly with those in the text.

- **Acknowledgement**

Acknowledgment to any advisory or financial assistance received in the course of work may be given.

- **Student Certificate**

Given by the Institute.

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- **Introduction**

Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

- **Chapters**

All chapters and sections must be appropriately numbered, titled and should neither be too long nor too short in length.

The first chapter should be introductory in nature and should outline the background of the project, the problem being solved, the importance, other related works and literature survey. The other chapters would form the body of the report. The last chapter should be concluding in nature and should also discuss the future prospect of the project.

- **Appendices**

The Appendix contains material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

- **References / Bibliography**

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based as per the examination Scheme given below :

Examination Scheme:

Components	**MRP**	**V**	**S**	**FP**	**R**
Weightage (%)	20	20	20	20	20

MRP – Mid Report Presentation, V – Viva, S – Synopsis, FP – Final Presentation, R - Report

MASTER OF SCIENCE (CYBER SECURITY) (M.Sc. (C.S.)

Programme Code: 121315

Duration – 2 Years Full Time

Programme Structure
and
Curriculum & Scheme of Examination

2021-23
(Choice Based Credit System)

AMITY UNIVERSITY

R A J A S T H A N

PREAMBLE

Amity University aims to achieve academic excellence by providing multi-faceted education to students and encourage them to reach the pinnacle of success. The University has designed a system that would provide rigorous academic programme with necessary skills to enable them to excel in their careers.

This booklet contains the Programme Structure, the Detailed Curriculum and the Scheme of Examination. The Programme Structure includes the courses (Core and Elective), arranged semester wise. The importance of each course is defined in terms of credits attached to it. The credit units attached to each course has been further defined in terms of contact hours i.e. Lecture Hours (L), Tutorial Hours (T), Practical Hours (P). Towards earning credits in terms of contact hours, 1 Lecture and 1 Tutorial per week are rated as 1 credit each and 2 Practical hours per week are rated as 1 credit. Thus, for example, an L-T-P structure of 3-0-0 will have 3 credits, 3-1-0 will have 4 credits, and 3-1-2 will have 5 credits.

The Curriculum and Scheme of Examination of each course includes the course objectives, course contents, scheme of examination and the list of text and references. The scheme of examination defines the various components of evaluation and the weightage attached to each component. The different codes used for the components of evaluation and the weightage attached to them are:

Components	Codes	Weightage (%)
Case Discussion/ Presentation/ Analysis	C	05 - 10
Home Assignment	H	05 - 10
Project	P	05 - 10
Seminar	S	05 - 10
Viva	V	05 - 10
Quiz	Q	05 - 10
Class Test	CT	10 - 15
Attendance	A	05
End Semester Examination	EE	50

It is hoped that it will help the students study in a planned and a structured manner and promote effective learning. Wishing you an intellectually stimulating stay at Amity University.

July, 2020

PROGRAMME LEARNING OUTCOMES (PLO)

MASTER OF SCIENCE (Cyber Security)– M.Sc.(C.S.)

PLO- 1 Demonstrating advanced knowledge in the field of cyber and information security in general and the following particular topics: computer and network security, security management, incident response, computational and digital forensics, biometrics, privacy, and security of critical infrastructure. The candidate possesses special insight and can demonstrate expertise in information security technology, digital forensics, or security management, depending on the chosen program track.

PLO- 2 Apply advanced knowledge of the current state-of-the-art in the field of cyber and information security.

PLO- 3 To apply knowledge in new areas within cyber and information security, in particular cloud computer security, security on the Internet of Things (IoT) and Cyber Forensic applications.

PLO- 4 Utilize knowledge of scientific methodology needed to plan and carry out research in the field of cyber and information security under supervision.

SKILL DEVELOPMENT DETAILS WITH CREDITS OF M.Sc. (Cyber Security) PROGRAMME

Sr. No.	Sem	Skill Development	Credit	Employability	Credit	Entrepreneurship	Credit	Total Nos.	Total Credit
1	I	4	8	2	4	1	3	**7**	**15**
2	II	3	7	4	8	1	3	**8**	**18**
3	III	5	13	2	4			**7**	**17**
4	IV			1	25			**1**	**25**
	Total	**12**	**28**	**9**	**41**	**2**	**6**	**23**	**75**

SKILL DEVELOPMENT SUBJECTS IN M.Sc.(C.S.) PROGRAMME		
Sem	**Course code**	**Course Name**
I	MCS102	Network Security and Cryptography
I	MCS122	Network Security and Cryptography Lab
I	MCS135	Secure Protocol Design
I	MCS145	Secure Protocol Design lab
II	MCS201	Cyber Forensic
II	MCS235	Wireless Networks
II	MCS245	Wireless Networks Lab
III	MCS301	Database and Application Security
III	MCS302	Secure Software Engineering
III	MCS333	Design and Analysis of Algorithms
III	MCS335	Python
III	MCS345	Python Lab
IV		

Employability		
Sem	**Course code**	**Course Name**
I	MCS103	Cyber Security -I
I	MCS123	Cyber Security - I Lab
II	MCS202	Cyber Security - II
II	MCS203	Intrusion Detection Systems
II	MCS222	Cyber Security - II Lab
II	MCS223	Intrusion Detection Systems Lab
III	MCS303	Ethical hacking and Digital Forensic Tools
III	MCS323	Ethical hacking and Digital Forensic Tools Lab
IV	MCS460	Internship

Entrepreneurship		
Sem	**Course code**	**Course Name**
I	MCS131	Information Security Risk Assessment and Assurance
II	MCS231	Cyber Laws & Security Policies

PROGRAMME STRUCTURE CREDITS SUMMARY
Master of Science (Cyber Security) 2021

	Credits PG (2 years/ 4 Semesters)							
Semester	CC	DE	VA	OE	EVS	NTCC	ANDP	Total
I	11	07	04	0	0	01	02	25
II	11	07	04	03	0	06	02	33
III	10	07	04	03	0	10	02	36
IV	0	0	0	0	0	25	0	25
Total	32	21	12	06	0	42	06	119

Core Courses	CC
Domain Electives	DE
Value Added Course	VA
Open Electives	OE
Environmental Science	EVS
Project Work (Non Teaching Credit Course)	NTCC
Anandam Project	NTCC

PROGRAMME STRUCTURE SUBJECTWISE CATEGORY SUMMARY

Master of Science (Cyber Security)-2021

	Courses/Subjects for PG (2 years/ 4 Semesters)Programme							
Semester	CC	DE	VA	OE	EVS	NTCC	ANDP	Total
I	05	09	06	0	0	01	01	22
II	05	07	06	01	0	01	01	21
III	04	07	06	01	0	03	01	22
IV	0	0	0	0	0	03	0	03
Total	14	23	18	02	0	8	03	68

Core Courses	CC
Domain Electives	DE
Value Added Course	VA
Open Electives	OE
Environmental Science	EVS
Project Work (Non Teaching Credit Course)	NTCC
Anandam Project	NTCC

PROGRAMME STRUCTURE

2021-23

FIRST SEMESTER

S. No.	Course Title	Category	Lecture (L)	Tutorial (T)	Practical (P)	Total Credits
CORE COURSE (CC)						
MCS101	Mathematical Foundation to Computer Science	CC	2	1	-	3
MCS102	Network Security and Cryptography	CC	2	1	-	3
MCS103	Cyber Security -I	CC	2	1	-	3
MCS122	Network Security and Cryptography Lab	CC	-	-	2	1
MCS123	Cyber Security - I Lab	CC	-	-	2	1
DOMAIN ELECTIVES (DE)						
Elective-I (Without Lab)	**Select any ONE**					
MCS131	Information Security Risk Assessment and Assurance	DE	2	1	-	3
MCS132	Internet Technology	DE				
MCS133	Digital Hardware Modeling	DE				
Elective-II (WithLab)	**Select any ONE**					
MCS134	Internet of Things	DE	2	1	-	3
MCS135	Secure Protocol Design	DE				
MCS136	Probability and Statistical Structure	DE				
MCS144	Internet of Things LAB	DE				
MCS145	Secure Protocol Design lab	DE	-	-	2	1
MCS146	Probability and Statistical Structure Lab	DE				
Non Teaching Credit Course (NTCC)						
MCS151	Report on Workshop / Social Work	NTCC	-	-	-	1
AND001	Anandam-I	ANDP	-	-	-	2
VALUE ADDED COURSES (VAC)						
BCS111	Communication Skills-I	VA	1	-	-	1
BSS111	Behavioural Science-I (Self Development and Interpersonal Skills)	VA	1	-	-	1
	Foreign Language	VA	2	-	-	2
FLT111	French	VA				
FLG111	German	VA				
FLS111	Spanish	VA				
FLC111	Chinese	VA				
	TOTAL					**25**

SECOND SEMESTER

S. No.	Course Title	Category	Lecture (L)	Tutorial (T)	Practical (P)	Total Credits
CORE COURSE (CC)						
MCS201	Cyber Forensic	CC	2	1	-	3
MCS202	Cyber Security - II	CC	2	1	-	3
MCS203	Intrusion Detection Systems	CC	2	1	-	3
MCS222	Cyber Security - II Lab	CC	-	-	2	1
MCS223	Intrusion Detection Systems Lab	CC	-	-	2	1
DOMAIN ELECTIVES (DE)						
Elective-I (Without Lab)	**Select any ONE**					
MCS231	Cyber Laws & Security Policies	DE	2	1	-	3
MCS232	Social Media Security	DE				
MCS233	Biometric Security	DE				
Elective-II (With Lab)	**Select any ONE**					
MCS234	MATLAB	DE	2	1	-	3
MCS235	Wireless Networks	DE				
MCS244	MATLAB Lab	DE	-	-	2	1
MCS245	Wireless Networks Lab	DE				
OPEN ELECTIVES (OE)						
	Open Elective	OE	2	1	-	3
Non Teaching Credit Course (NTCC)						
MCS250	Minor Project	NTCC	-	-	-	6
AND002	Anandam-II	ANDP	-	-	-	2
VALUE ADDED COURSES (VAC)						
BCS211	Communication Skills-II	VA	1	-	-	1
BSS211	Behavioural Science-II (Behavioural Communication and Relationship Management)	VA	1	-	-	1
	Foreign Language	VA	2	-	-	2
FLT211	French	VA				
FLG211	German	VA				
FLS211	Spanish	VA				
FLC211	Chinese	VA				
	TOTAL					**33**

THIRD SEMESTER

S. No.	Course Title	Category	Lecture (L)	Tutorial (T)	Practical (P)	Total Credits
CORE COURSE (CC)						
MCS301	Database and Application Security	CC	2	1	-	3
MCS302	Secure Software Engineering	CC	2	1	-	3
MCS303	Ethical hacking and Digital Forensic Tools	CC	2	1	-	3
MCS323	Ethical hacking and Digital Forensic Tools Lab	CC	-	-	2	1
DOMAIN ELECTIVES (DE)						
Elective-I (Without Lab)	**Select any ONE**					
MCS331	Artificial Intelligence and Neural Network	DE	2	1	-	3
MCS332	Human Computer Interaction	DE				
MCS333	Design and Analysis of Algorithms	DE				
Elective-II (With Lab)	**Select any ONE**					
MCS334	Principles of Virtualization	DE	2	1	-	3
MCS335	Python	DE				
MCS344	Principles of Virtualization Lab	DE	-	-	2	1
MCS345	Python Lab	DE				
OPEN ELECTIVES (OE)						
	Open Elective	OE	2	1	-	3
Non Teaching Credit Course (NTCC)						
MCS350	Minor Project	NTCC	-	-	-	6
MCS351	Report on Paper Presentation in Conference	NTCC	-	-	-	1
MCS352	Summer Internship Project	NTCC	-	-	-	3
AND003	Anandam-III	ANDP	-	-	-	2
VALUE ADDED COURSES (VAC)						
BCS311	Communication Skills-III	VA	1	-	-	1
BSS311	Behavioural Science-III (Leading Through Teams)	VA	1	-	-	1
	Foreign Language		2	-	-	2
FLT311	French	VA				
FLG311	German	VA				
FLS311	Spanish	VA				
FLC311	Chinese	VA				
	TOTAL					**36**

FOURTH SEMESTER

S. No.	Course Title	Category	Lecture (L)	Tutorial (T)	Practical (P)	Total Credits
Non Teaching Credit Course (NTCC)						
Elective	**Select any ONE**					
MCS460	Internship	NTCC	-	-	-	25
MCS461	Project Work	NTCC				
MCS462	Dissertation	NTCC				
	TOTAL					**25**

MATHEMATICAL FOUNDATION TO COMPUTER SCIENCE

Course Code	L	T	P/FW	CREDITS	SEMESTER
MCS101	2	1	-	3	1

Course Learning Outcome

CLO 1 Be familiar with set algebra

CLO 2 Identified the types of relations and functions

CLO 3 Recognize the fundamental properties of groups and subgroups

CLO 4 Model problems in Computer Science using graphs and trees

CLO 5 Describe the fundamental counting principle and Improve and outline the logical thinking and mathematical logic.

Course Contents:

Module I

Set Theory: Definition, Types of sets, equality of sets, Subset, Power Set, Universal set, Union, intersection and compliment of sets, Algebra of sets, Venn diagram, proof of identities, Application of set theory, Cartesian product of sets, **:** Relation as Cartesian product of sets, types of relations, Composition of relations, Pictorial representation of relations, equivalence relation, Partial order relation. Definition of function, Types of Functions.

Module II

Algebraic Functions: Properties, Semi group, Monoid, Subgroup , Group, Abelian group, properties of group, Cyclic group, Permutation group, Homomorphism.

Module III

Graph Theory and Tree

Basic Terminology, Walks, paths, circuits, connectedness, Handshaking Lemma, Isomorphism, Sub graphs, and Union of Graphs, Reach ability, Eulerian Graph and Union of Graphs, Eulerian Graph, Shortest path problem, , Hamiltonian graph, Traveling Salesman Problem, Bipartite graphs. Introduction to trees, Rooted trees, path length in rooted trees, spanning trees, , spanning trees of a weighted graph, cut sets and cut vertices, , Minimum spanning tree.

Module IV

Propositional Logic

Preposition, First order logic, Basic Logical operations, Tautologies, Contradictions, Algebra of Proposition. Logical implications and Double implications, Arguments. Mathematical Induction, Recurrence Relation.

Module V

Combinatorics

Theorem and Binomial Coefficient, Pascal's Triangle, Permutations, Permutation with Repetition, Combinations, Ordered and Unordered Permutations.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Liptschutz, Seymour, “Discrete Mathematics”, TMH.

References:

- Trembley, J.P & R. Manohar, “Discrete Mathematical Structures with Application to Computer Science”, TMH
- Kenneth H. Rosen, “Discrete Mathematics and its applications”, TMH.
- Doerr Alan &Levasseur Kenneth, “Applied Discrete Structure for Computer Science”. Galgotia Pub Pvt Ltd.
- Gersting, “Mathematical Structure for Computer Science”, WH Freeman & M Macmillan.
- Kumar Rajendra, “Theory of Automata : Language and Computation”, PPM.
- C.L. Liu, “Elements of Discrete Mathematics”, McGraw Hill.
- Peter Grossman, “Discrete Mathematics for Computer “, Palgrave Macmillian.

NETWORK SECURITY AND CRYPTOGRAPHY

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS102	2	1	-	3	1

Course Learning Outcome

CLO1: To get a basic understanding of principles and practice of cryptography and network security

CLO2: To be able to evaluate security of systems with respect to appropriate use of security services and mechanisms

CLO3: To be able to design basic security architectures through selection and integration of relevant security components

MODULE I: **Physical Layer and Data Link Layer**

Physical Layer : The Physical Layer-Communication Signals, Physical Signaling and Encoding, Representing Bits, Physical Media-Connecting Communication. **Data Link Layer :** Introduction, Data Link Layer-Accessing the media .Media Access Control Techniques, Media Access Control Addressing and Framing Data.

MODULE II: Network Layer and Transport Layer

Network Layer Networks-dividing host into groups, Routing –How our data packets are handled, Routing process. LANs, WANs and Internetworks Network Addressing. **Transport Layer :** The TCP protocol –communicating with reliability, Managing TCP sessions, The UDP protocol communicating with low overheads

MODULE III: Application Layer

Application Layer Functionality and Protocols : Provision for applications and services, Application layer protocols and services. Overview of Ethernet, Ethernet –Communication through the LAN, The Ethernet Frame ,Ethernet Media Access Control, Ethernet Physical Layer, Hubs and Switches, Address Resolution Protocol(ARP)

MODULE IV: Cryptography Algorithms

Introduction: Attacks, Services and Mechanisms, Security attacks, Security services, A Model for Internetwork security. Classical Techniques: Conventional Encryption model, Steganography, Classical Encryption Techniques.

Modern Techniques: Simplified DES, Block Cipher Principles, Data Encryption standard, Strength of DES, Differential and Linear Cryptanalysis, Block Cipher Design Principles and Modes of operations. Algorithms: Triple DES,

MODULE V: Asymmetric cryptography

Public Key Cryptography: Principles, RSA Algorithm, Key Management, Diffie-Hellman. Message authentication and Hash functions. , Message Digest Algorithm. Digital signatures, Kerberos, X.509.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Cisco Networking Academy Programme CCNA 1 & 2 Companion Guide, 3rd Edn by Pearson Education
- Cisco Networking Academy Programme CCNA 1 & 2 Lab Companion, 3rd Edn by Pearson Education
- William Stallings, Cryptography and Network Security Principles and Practices, 5th Edition, PHI/Pearson, 2011.
- William Stallings, Network Security Essentials Applications and Standards, 4thEdition, Pearson Education, 2011.
- Christof Paar and Jan Pelzl , Understanding Cryptography – A Textbook for Students and Practitioners Christof Paar and Jan Pelzl, Springer, 2010

References:

- Data Communications and Networking by Behrouz Forouzan, 3e, Tata McGraw-Hill
- Computer Networks by Andrews S. Tanenbaum, 4e, Pearson Education
- Eric Maiwald, Fundamentals of Network Security, 1 Edition, Dreamtech press, 2008.
- Charlie Kaufman, Radia Perlman and Mike Speciner, Network Security Private Communication in a Public World, 2nd Edition, Pearson/PHI, 2009.
- Whitman, Principles of Information Security, 3rd Edition, Thomson, 2008.

CYBER SECURITY - I

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS103	2	1	-	3	1

Course Learning Outcome

CLO1: Understand of how a computer's hardware and software resources are managed by the Operating System with its practical implementation using Linux OS and to understand the various techniques and strategies to improve the performance and security of an operating system design.

CLO 2: Articulate the importance of Information and Access Controls mechanisms for implementation of security in a system.

CLO 3: Comprehend the various cyber security tools available to provide proactive and reactive approach to the security in a system and recognize various cyber security attacks and how they happen to help design some form of counter measures to safeguard the security of the system.

CLO 4: Understand the basic terminologies associated with database management system with practical implementation in terms of data definition, data manipulation, and data control commands using structured query language concept and to understand the various techniques and strategies to improve the performance and security of a database application.

Module I: Introduction to Operating System and Linux: Basic Elements of OS, OS Functions, Types of OS, OS Terminologies, Linux Command Line, Linux Features, Basic Navigation, Files and Directories, Manual Pages, File Manipulation, Wildcards, Permissions, File Hierarchy, Filters, Grep and Regular Expressions, Piping and Redirection, Process Management, User Management, File Security, Shell Scripting, Security in Operating Systems.

Module II: Information and Access Controls

Types of Security, Information Classification and their levels, Process for managing classified information, Access Control, Types of Access Control - Preventative access control, Deterrent access control, Detective access control, Corrective access control, Recovery access control, Compensation access control, Directive access control, Administrative access controls, Logical/technical access controls, Physical access controls.

Module III: Cyber Security Tools

Cyber Security Goals, Tools for Confidentiality - Encryption, Access control, Authentication, Authorization, Physical Security, Tools for Integrity - Backups, Checksums, Data Correcting Codes, Tools for Availability - Physical Protections, Computational redundancies.

Module IV: Cyber Security Attacks

Types of Cyber Security Attacks, Web-based Attacks (Injection Attack, DNS Spoofing, Session Hijacking, Phishing, Brute Force, Denial of Service, Distributed Denial of Service, Dictionary Attack, URL Interpretation, File Inclusion Attack, Man in the Middle Attack), System-based Attack (Virus, Worm, Trojan Horse, Backdoors, Bots), Types of Cyber Attackers.

Module V: Database Management and Security

Data, Information, and Knowledge, Database (DB), Database Management System (DBMS), DB Characteristics, DB Users, DBMS Architecture, DBMS Models, DB Relationships, SQL Overview, DML, DDL, and DCL commands, Security in Database and its Design Consideration.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text Books:

Abraham Silberschatz, Peter B. Galvin, Greg Gagne, "Operating System Concepts Essentials", 2 Edition, Wiley, 2014.

William E. Shotts, Jr., "The Linux Command Line: A Complete Introduction", No Starch Press, 2012.

Crystal Panek, "Security Fundamentals", John Wiley and Sons, 2019.

Charles J. Brooks, ,Christopher GrowPhilip Craig, "Cybersecurity Essentials", John Wiley and .Sons, 2018

Mark L. Gillenson, "FUNDAMENTALS OF DATABASE MANAGEMENT SYSTEMS", Wiley, 2008.

Alan Beaulieu, "Learning SQL: Master SQL Fundamentals", O'Reilly, 2009

References:

William Stallings, "Operating Systems: Internals and Design Principles", Prentice Hall, 2009.

John Purcell, Robert Kiesling, "Linux: The Complete Reference", LinuxSystem Labs, 1998.

Chuck Easttom, "Computer Security Fundamentals", Pearson, 2011.

C. J. Date, "An Introduction to Database Systems", Addison-Wesley, 2000.

Martin Gruber, "Mastering SQL", SYBEX, 2000

NETWORK SECURITY AND CRYPTOGRAPHYLAB

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS122	-	-	2	1	1

Course Learning Outcome

CLO 1

To train more professional in the area of Cyber Security

CLO 2

Evaluate security of systems with respect to appropriate use of security services and mechanism

CLO 3

To be able to design basic security architectures through selection and integration of relevant security components

List of Experiments

1.0 Observing TCP and UDP using Netstat

- Explain common **netstat** command parameters and outputs.
- Use **netstat** to examine protocol information on a pod host computer.

2.0TCP/IP Transport Layer Protocols, TCP and UDP

- Identify TCP header fields and operation
- Identify UDP header fields and operation

3.0 Application and Transport Layer Protocols Examination

- Configure the host computer to capture Application layer protocols.
- Capture and analyze HTTP communication between the pod host computer and a web server.
- Capture and analyze FTP communication between the pod host computer and an FTP server.
- Observe TCP establish and manage communication channels with HTTP and FTP connections

4.0 Examining a Device's Gateway

- Understand and explain the purpose of a gateway address.
- Understand how network information is configured on a Windows computer.
- Troubleshoot a hidden gateway address problem

6.0 Examining a Route

- Use the **route** command to modify a Windows computer routing table.
- Use a Windows Telnet client command **telnet** to connect to a Cisco router.
- Examine router routes using basic Cisco IOS commands.

7.0 Ping and Traceroute

- Use the **ping** command to verify simple TCP/IP network connectivity.
- Use the **tracert/traceroute** command to verify TCP/IP connectivity.

8.0 IPv4 Address Subnetting Scenario

When given an IP address, network mask, and subnetwork mask, you will be able to determine other information about the IP address such as:

- The subnet address of this subnet
- The broadcast address of this subnet
- The range of host addresses for this subnet

9.0 Implement the encryption and decryption through Cryp Tool.

- Caesar cipher
- Shift cipher
- Affine cipher
- Substitution with symbols
- Vigen`ere cipher
- Hill cipher

10.0 Applications of asymmetric cryptography

- One-way functions
- The Diffie-Hellman key exchange protocol
- The RSA procedure

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

CYBER SECURITY - I LAB

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS123	-	-	2	1	1

Course Learning Outcome

1. Investigate different concepts of operating system in terms of application, security or performance.

2. Articulate the importance of Information and Access Controls mechanisms for implementation of security in a system.

3. Apply his/her knowledge in new areas within field of basic and advance system security and reactive approach to the security in a system and recognize various cyber security attacks

and how they happen to help design some form of counter measures to safeguard the security of the system.

4. Database management system with practical implementation in terms of data definition, data manipulation, and data control commands using structured query language concept and to understand the various techniques and strategies to improve the performance and security of a database application.

Experiments

1. Installation of LINUX Operating System
2. Implementation of general purpose utilities commands.
3. Implementation of user & session management commands.
4. Implementation of file system navigation commands, text processing tools, communication commands.
5. Write a shell script program to display “HELLO WORLD”.
6. Write a shell script program to develop a scientific calculator.
7. Write a shell script program that prompts the user for the password. The user has maximum of 3 attempts. If the user enters the correct password, the message “Correct Password” is displayed else the message “Wrong Password”.
8. Write a program to generate all combinations of 1, 2 and 3 using for loop.

9. Write a shell script program that will receive any number of filenames as arguments. The shell script should check whether such files already exist. If they do, then it should be reported. The files that do not exist should be created in a sub-directory called mydir. The shell script should first check whether the sub-directory mydir exists in the current directory. If it doesn't exist, then it should be created. If mydir already exists, then it should be reported along with the number of files that are currently present in mydir.
10. Write a Shell Script program to show the implementation of positional parameters.
11. Write a grep/egrep shell script program to find the number of words character, words and lines in a file.
12. Shell Script program to implement read, write, and execute permissions.
13. Implement SQL DDL Commands (Create, Drop, Alter, Truncate)
14. Implement SQL DML Commands (Select)
15. Implement SQL DCL Commands (Grant, Revoke)
16. Implement SQL TCP Commands (Commit, Rollback)

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

INFORMATION SECURITY RISK ASSESSMENT AND ASSURANCE

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS131	2	1	-	3	1

Course Learning Outcome

CLO 1 Recognize the concept of security risk

CLO 2 Identify the utility of to manage security risk

CLO 3 Describe the concept and principals of security

CLO 4 Apply risk assessment concept to audit risk

Module I: Introduction

History, What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access.

MODULE II Myths Of Information Security Management

The big picture-Learning from experience-Weaknesses in Information Security-The extent of crime in cyberspace- The cyberspace crime syndrome-Policies and technologies- A new framework for information security.

MODULE III Information Security Assessments

Risk assessment-methodology- Generations of risk assessment techniques- Quantitative approach to risk assessment-Problems with Quantitative approach – NIST ALE- Baseline approach.

MODULE IV Security Management Concepts And Principles

Measuring ROI on security- Security patch management- Purposes of Information Security management- The building blocks of information security- Human side of information security- Security management- Securing new information technology.

MODULE V Risk Assessment

What is Risk? –Information Security Risk Assessment Overview- Drivers, Laws and Regulations- Risk Assessment Frame work – Practical Approach. System Risk Analysis- Risk Prioritization- System Specific Risk Treatment- Issue Registers- Methodology- Result- Risk Registers- Post Mortem.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text Books:

1. Donn Parkers, “Fighting Computer Crime: “A New Framework for Protecting Information”, John Wiley & Sons, 2003.

2. Micki Krause, Harold F.Tripton, “Information Security Management Handbook”, Auerbach Publications, 2012.
3. Mark Talabis, “Information Security Risk Assessment Toolkit: Practical Assessments through Data Collection and Data Analysis”, Kindle Edition. ISBN: 978-1-59749-735-0.
4. David L. Cannon, “CISA Certified Information Systems Auditor Study Guide”, SYBEX Publication. ISBN: 978-0-470-23152-4.

INTERNET TECHNOLOGY

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS132	2	1	-	3	1

Course Learning Outcome

1. To obtain basics involved in publishing content on the World Wide Web.
2. To gain fundamentals of how the Internet and the Web function, a basic understanding of graphic production with a specific stress on creating graphics for the Web,
3. To understand more advanced topics such as programming and scripting. This will also expose students to the basic tools and applications used in Web publishing

MODULE I

INTRODUCTION: What the Internet is; History and Timeline; Technologies and Services; Basic Operating System Utilties; ping and traceroute; RFCs; Brief overview of computer networking concepts: architecture, layers, packets, data transmission.

BASIC NETWORK PROGRAMMING: Comer's simple networking API; Java's java.net package; examples using each API.

MODULE II

INTERNETWORKING WITH ETHERNET, IP, ARP, ICMP: Ethernet details (addressing, frame format, twisted pair, hubs, switches); Routers, Gateways. IP Addresses, Subnets, ARP. IP Headers, IP Routing (fragmentation and reassembly), ICMP.

UDP, TCP, AND SOCKETS: Network service types, ports and sockets; UDP: header format, etc.; TCP: header format, window, connection setup, etc. Socket API, Java Socket Programming.

APPLICATION-LEVEL PROTOCOLS DNS, SMTP, POP, FTP, HTTP: Headers, Formats, Operations of each. Mailing Gateways, Mailing Lists, URIs.

MODULE III

XML: Markup, Elements, Attributes, Tags, Entity References, etc. Formal specifications. Examples. DTDs, Namespaces, All about XHTML, XSLT, XPath, XLinks, XPointers, CSS, Schemas, SAX and DOM.

WEB BROWSER AND WEB SERVER ARCHITECTURES: Browser architectures and client-side extensions such as plug-ins, Java applets, and JavaScript. Server architectures, operation, performance issues, caching, server-side extensions such as CGI, Servlets, JSP, PHP, Apache modules, etc. Proxies.

MODULE IV

INTERNET SECURITY: Basic Security Concepts, Strategies for securing assets, Computer Security vs. Network Security; Kinds of attacks; Firewalls: architecture, implementation and configuration, DMZ and external routers; Packet sniffing, packet filtering, etc; Cryptography and Cryptographic Protocols: Public-Key encryption, authentication schemes, SSL, IPSEC, VPNs; Java Security and Cryptography APIs.

SCALING AND AVAILABILITY: Availability, Fault-Tolerance, Load Balancing, Points of Failure; Clusters; Disaster Recovery.

MODULE V

ARCHITECTURE AND IMPLEMENTATION OF ENTERPRISE SYSTEMS: Tiered architecture for the enterprise: 2-tier vs. 3-tier. J2EE Technologies emphasizing JDBC, Transactions, XML and

Enterprise Java Beans. EJB details: session vs. entity beans; persistence mechanisms. Implementation of complete system from servlets through EJBs through a database.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text Books:

1. Douglas E. Comer ,"Internetworking with TCP/IP, Principles, Protocols, and Architecture", Addison-Wesley, 5th edition, Vol 1, 2005,ISBN-10: 0131876716 | ISBN-13: 978-0131876712 .

2. Douglas E. Comer, David L. Stevens ,"Internetworking with TCP/IP Vol. III, Client-Server Programming and Applications", Addison-Wesley, 2nd edition, 2000 , ISBN-10: 013260969X, ISBN-13: 978-0132609692. 3. Wendell Odom," CCNP Route 642-902, CCIE", Official Certification Guide, Pearson.

3. Behrouz A. Forouzan, "Data Communications and Networking", McGraw-Hill, 5th edition, 2012, ISBN- 10: 0073376221, ISBN-13: 978-0073376226

DIGITAL HARDWARE MODELING

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS133	2	1	-	3	1

Course Learning Outcome

1. Demonstrate knowledge on HDL design flow, digital circuits design ,switch de-bouncing, metastability, memory devices applications
2. design and develop the combinational and sequential circuits using behavioral modeling
3. solving algorithmic state machines using hardware description language
4. analyze the process of synthesizing the combinational and sequential descriptions
5. memorizing the advantages of programmable logic devices and their description in Verilog

MODULE I

Introduction to digital circuit design flow, Design Representation, VLSI Design Styles, Verilog variables, operators and language constructs, verilog modeling examples.

MODULE II

Modeling combinational circuits using Verilog, verilog description styles, Modeling sequential circuits using Verilog, procedural assignment, user defined primitives.

MODULE III

Verilog test benches and design simulation, modeling finite state machines, Behavioral versus structural design modeling, datapath and controller design, synthesizable verilog.

MODULE IV

Modeling memory, modeling register banks, modeling issues: pipelining, memory, switch level modeling

MODULE V:

Processor design using verilog, pipeline implementation of a processor, verilog modeling of the processor

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text Books:

1. J. Bhasker, “Verilog HDL Synthesis: A Practical Primer”, B. S. Publications, 1998.

2. M. D. Ciletti, “Advanced VLSI Design with the Verilog HDL”, Prentice-Hall of India, 2005.

INTERNET OF THINGS

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS134	2	1	-	3	1

Course Learning Outcome

1. Able to understand the application areas of IOT
2. Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks
3. Able to understand building blocks of Internet of Things and characteristics.

MODULE I

Introduction to IoT- Internet of Things & their characteristics, Design- Physical & Logical design, IoT Reference Model- Domain Model, Information Mode, Functional Model, and Communication Model. M2M and IoT technology fundamentals.

MODULE II

Sensor Technology- Introduction to wireless sensor networks, Sensor nodes- Sensing and sensors, Challenges and Constraints, Communication Interfaces- Protocols, Application of Wireless sensors.

MODULE III

Embedded System- Introduction to embedded systems, Application Areas, Categories of embedded systems, Overview of embedded system, Architecture of embedded systems, Hardware architecture, Software architecture, Application Software, Communication Software.

MODULE IV

Domain Specific Application Categories- Big Data Analytics for IoT, Privacy and Security in IoT, Smart City, Cloud Storage & Computing.

MODULE V

Programming & Interfacing- Open Source Platforms: PIC, Arduino, Sketch and Raspberry Pi. Getting used to Arduino, Sensor Characterization- Safety, Basic Electronics (circuit theory, measurements, parts identification). Sensors and Software- Understanding Processing Code Structure, variables and flow control, interfacing to the Real World.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text Books:

1. Bernd Scholz-Reiter, Florian Michahelles, “Architecting the Internet of Things”, ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer
2. WaltenegusDargie, Christian Poellabauer , “Fundamentals of Wireless Sensor Networks, Theory and Practice”, Wiley Series on wireless Communication and Mobile Computing, 2011
3. Arnold. S. Berger, “Embedded Systems Design - An introduction to Processes, Tools and Techniques”, Easwer Press, 2001

4. Programming Interactivity, Second Edition By Josha Noble, 2012

SECURE PROTOCOL DESIGN

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS135	2	1	-	3	1

Course Learning Outcome

By the end of the course Student will

1. Get the exposure to various protocols.
2. Gain knowledge on various secure mechanisms through set of protocols.
3. Efficiently design new set of protocols.
4. Learn Security issues and overcome means with protocols.

MODULE I

OSI: ISO Layer Protocols:-Application Layer Protocols-TCP/IP, HTTP, SHTTP, LDAP, MIME,-POP& POP3-RMON-SNTP-SNMP. Presentation Layer Protocols-Light Weight Presentation Protocol Session layer protocols.

MODULE II

RPC protocols-transport layer protocols-ITOT, RDP, RUDP, TALI, TCP/UDP, compressed TCP. Network layer Protocols – routing protocols-border gateway protocol-exterior gateway protocol-internet protocol IPv4- IPv6- Internet Message Control Protocol- IRDPTransport Layer Security-TSL-SSL-DTLS.

MODULE III

Data Link layer Protocol – ARP – In ARP – IPCP – IPv6CP – RARP – SLIP .Wide Area and Network Protocols- ATM protocols – Broadband Protocols – Point to Point Protocols – Other WAN Protocols-security issues.

MODULE IV

Local Area Network and LAN Protocols – ETHERNET Protocols – VLAN protocols – Wireless LAN Protocols – Metropolitan Area Network Protocol – Storage Area Network and SAN

MODULE V

Protocols -FDMA, WIFI and WIMAX Protocols- security issues. Mobile IP – Mobile Support Protocol for IPv4 and IPv6 – Resource Reservation Protocol. Multicasting Protocol – VGMP – IGMP – MSDP .Network Security and Technologies and Protocols – AAA Protocols – Tunneling Protocols – Secured Routing Protocols – GRE- Generic Routing Encapsulation – IPSEC – Security.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text Books:

1. Jawin: “Networks Protocols Handbook”, 3rd Edition, Jawin Technologies Inc., 2005.
2. Bruce Potter and Bob Fleck : “802.11 Security”, 1st Edition, O“Reilly Publications, 2002.

References:

1. Ralph Oppliger :“SSL and TSL: Theory and Practice”, 1st Edition, Arttech House, 2009.
2. Lawrence Harte: “Introduction to CDMA- Network services Technologies and Operations”, 1st Edition, Althos Publishing, 2004.
3. Lawrence Harte: “Introduction to WIMAX”, 1st Edition, Althos Publishing, 2005.

PROBABILITY AND STATISTICAL STRUCTURE

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS136	2	1	-	3	1

Course Learning Outcome

1. Define the principal concepts about probability.
2. Express the concept of probability and its features.
3. Explain the concept of a random variable and the probability distributions.
4. Gain the fundamental concepts in statistical analysis with emphasis on their applications to computer science

Course Contents:

Module -I:

Probability: Sample space and events – Probability – The axioms of probability - Some elementary theorems - Conditional probability – Baye's theorem.

Module -II:

Random variables – Discrete and continuous – Distribution – Distribution function.Distribution - Binomial, poisson and normal distribution – related properties.

Module -III:

Sampling distribution: Populations and samples - Sampling distributions of mean (known and unknown) proportions, sums and differences.

Module-IV:

Test of Hypothesis – Means and proportions – Hypothesis concerning one and two means – Type I and Type II errors. One tail, two-tail tests. Tests of significance – Student's t-test, F-test, chi-square test, ANOVA test.

Curve fitting: The method of least squares – Inferences based on the least squares estimations - Curvilinear regression – multiple regressions – correlation for univariate and bivariate distributions.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

TEXT BOOKS:

1. Probability and statistics for engineers:Erwin Miller And John E.Freund. Prentice-Hall of India / Pearson , Sixth edition.
2. Text book of Probability and Statistics by Dr.ShahnazBathul, V.G.S.Publishers 2003.

REFERENCE BOOKS:

1. Probability, Statistics and Random Processes Dr.K.Murugesan&P.Gurusamy by Anuradha Agencies, Deepti Publications.
2. Advanced Engineering Mathematics (Eighth edition), Erwin Kreyszig, John Wiley and Sons (ASIA) Pvt. Ltd., 2001.
3. Probability and Statistics for Engineers: G.S.S.BhishmaRao,sitech., Second edition 2005.

INTERNET OF THINGS LAB

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS144	-	-	2	1	1

Course Learning Outcome

Students will be explored to the interconnection and integration of the physical world and the cyber space. They are also able to design & develop IOT Devices.

1. Arduino Installation and Setup Guide
2. Creating REST APIs and Using Them To Send and Receive Sensor Data
    a. Installing Python
    b. Installing MongoDB
    c. Installing Postman (REST API Client)
    d. Installing Robomongo
    e. Installing Flask (Python Micro framework)
    f. Installing Flask_bcrypt library
    g. Installing Pymongo library
3. Installing REST APIs
    a. App.py
    b. IoT API
    c. IoT Endpoint API
    d. Models.py
4. Data Analytics
    a. Insert Sample Data in MongoDB
    b. To Insert Data to Database from a Local File
    c. Performing MapReduce
    d. Creating a Web Service to Fetch Data from Mongo DB
    e. Performing Visualization on Fetched Data
5. Demonstrate the working of Embedded Programming Class.
6. Demonstrate the working of Sensor Calibrations and Usage.
7. Demonstrate the working of Protocol Implementations.
8. Demonstrate the working of Java/Python Programming Class.
9. Demonstrate the working of Big Data Programming Class.
10. Demonstrate the working of Analytics Programming Class.
11. Demonstrate the working of Web Services Programming Class.
12. Demonstrate the working of Cloud based Application Development.
13. Demonstrate the working of C Programming Class.
14. Demonstrate the working of Arduino/Raspberry Pi Programming Class.

Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

SECURE PROTOCOL DESIGN LAB

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS145	-	-	2	1	1

1. Designing Remote Connectivity
2. Designing IP Addressing
3. Selecting Routing Protocols
4. Voice Network Design
5. Wireless Network Design
6. Designing Security Solutions
7. Installation and Configuration of Linux
8. Linux Systems Administration
9. Understanding Shells and Scripting with Linux
10. Setting up Samba and a Windows-Linux network
11. Setting up security with Linux
12. Setting up a Web Server
13. Learn the fundamentals of wireless LAN
14. Learn various standards related to wireless LANs
15. Learn about the security aspects of wireless LANs.

Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

PROBABILITY AND STATISTICAL STRUCTURE LAB

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS146	-	-	2	1	1

Course Learning Outcome

1. Organize, manage and present data.
2. Analyze statistical data graphically using frequency distributions and cumulative frequency distributions.
3. Analyze statistical data using measures of central tendency, dispersion and location.

1. Frequenciesanalysis
2. Descriptiveanalysis
3. Crosstabsanalysis
4. One Sample t – Testanalysis
5. Independent Sample t – Test
6. Paired Sample t – Testanalysis
7. One-Way ANOVAanalysis
8. Chi – Square Testanalysis
9. correlation analysis
10. Multiple Regressionanalysis

Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

REPORT ON WORKSHOP/ SOCIAL WORK

Course Code	L	T	P	Credit	SEMESTER
MCS 151	-	-	-	1	1

Course Learning Outcome

Student will learn how to write report on workshop/social work

Rules and Regulations

- 2nd Year / 3rd Year Students for which the students and the faculty members can start preparations well in advance prior to the scheduled conference / seminar / workshop.
- The number of students going for any conference / seminar / workshop should be manageable.
- A proposal for the proposed conference / seminar / workshop should be drafted and presented to the HoI reflecting the following key points:
    - Entire activity plan
    - Route Map
    - What are the objectives for the students?
    - What they need to learn, do, and prepare before the conference / seminar / workshop?
    - List of prospective students with Contact Details
    - List of Faculty Coordinators with Contact Details
- After getting approval from the HoI, a note sheet should be prepared and all necessary permission and approval from the competent authorities should be obtained.
- The attention and co-operation of all students and parents are requested to attend the conference / seminar / workshop most effectively. Signing of the letter of Indemnity Bond (Consent-cum-Undertaking) is mandatory for all the parents of students going for conference / seminar / workshop in or outside Jaipur. Duly executed Indemnity Bond should be submitted to HoI Office at least 2 days prior to the visit, without which the accompanying Staff coordinator shall not permit the student to participate in the industrial visit
- The list of students participating in conference / seminar / workshop shall be handed over to the concerned HODs, Staff coordinators.
- Students should be present in formals.
- Students should carry the College Identity Cards during their journey.
- Discipline should be maintained during the conference / seminar / workshop. Any violation will be viewed very seriously.
- A report of the conference / seminar / workshop is to be submitted in 5 days time by students / faculty coordinators once the students are back.

The report to be prepared should reflect the following:-

- What happened at the conference / seminar / workshop the students attend and how does it relate in the best way to the preparations and the learning objectives.
- How do the students will use the outcome of conference / seminar / workshop after it is over?
- What will they gain from it and how can they set up activities that transfer the experience into learning?
- Evaluation parameters for the success of the experience of conference / seminar / workshop.

The layout guidelines for the Report:

1. File should be in the following specification:

- A4 size paper

- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components:

- Front Page
- Table of Content
- Acknowledgement
- Student Certificate
- Company Profile (optional)
- Introduction
- Main Body
- References / Bibliography

ASSESSMENT OF THE INTERNSHIP FILE

The student will be provided with the Student Assessment Record (SAR) to be placed in front of the Report File. Each item in the SAR is ticked off when it is completed successfully. The faculty will also assess each item as it is completed. The SAR will be signed by the student and by the faculty to indicate that the File is the student's own work. It will also ensure regularity and meeting the delaines.

Examination Scheme:

Components	**V**	**S**	**R**	**FP**
Weightage (%)	20	20	20	40

V – Viva, S – Synopsis, FP – Final Presentation, R - Report

ANANDAM-I

Course Code: AND001 **Semester 1** **NTCC Credit :02**

Course Learning Outcomes:

The student should develop:

- Awareness and empathy regarding community issues
- Interaction with the community and impact on society
- Interaction with mentor and development of Student teacher relationship
- Interaction among students, enlarge social network
- Cooperative and Communication skills and leadership qualities
- Critical thinking, Confidence and Efficiency

Course Objectives:

After the completion of this course, students will be able to:

- apply their knowledge and skills to solve specific community problem
- learn to plan, lead, and organize community events have a sense of belonging to their college campus and community and find something they are interested in doing during their free time
- make new friends, expand social network, and boost social skills and mental health.
- be useful to society as it will protect them against stress, frustration, and depression

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants, phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.
- University will forward the report to the state level committee.

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.
3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
6. For the topic chosen by the group, students are recommended to cover the following points:
    a) Current scenario (Regional, national and international level as applicable)
    b) Future predictions
    c) Duty of the government
    d) Government policies (related to the topic), if any
    e) Duty of public
    f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
3. Conclusion is clearly stated. The underlying logic is explicit.

COMMUNICATION SKILLS-I

CODE	L	T	P/FW	CREDITS	SEMESTER
BCS 111	1	-	-	1	1

Course Learning Outcome

1. Investigate their strengths and personal insights to be revealed in a Formal Setup of Communication.

2. Create right selection of words and ideas while also choosing the appropriate networking channel for formal communication

3. Apply their acquired knowledge with the appropriate selection of channel of formal communication.

4. Develop and empower self with the power of Words.

5. Enhance their technical writing capabilities while also learning about do's and don'ts of technical drafting.

Course Objective:

The Course is designed to give an overview of the four broad categories of English Communication thereby enhance the learners' communicative competence.

Course Contents:

Module I: Listening Skills

Effective Listening: Principles and Barriers

Listening Comprehension on International Standards

Module II: Speaking Skills

Pronunciation and Accent

Reading excerpts from news dailies & magazines

Narrating Incident; Story telling.

Extempore & Role Plays

Module III: Reading Skills

Vocabulary: Synonyms, antonyms, diminutives, homonyms, homophones

Idioms & phrases

Foreign words in English

Module IV: Writing Skills

Email Writing

Précis Writing

Cover Letter writing

Coherence and structure

CV writing

Module V: Activities

News reading

Picture reading

Movie magic

Announcements

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A
Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File

GD – Group Discussion

GP – Group Presentation

Text & References:

- Working in English, Jones, Cambridge
- Business Communication, Raman –Prakash, Oxford
- Speaking Personally, Porter-Ladousse, Cambridge
- Speaking Effectively, Jermy Comfort, et.al, Cambridge

BEHAVIOURAL SCIENCE-I

(Self Development and interpersonal Skills)

CODE	L	T	P/FW	CREDITS	SEMESTER
BSS 111	1	-	-	1	1

Course Learning Outcome

1. Recognize the relation critical thinking with various mental processes.
2. Identify hinderance to problem solving processes.
3. Analyse the steps in problem-solving process.
4. Create plan of action applying creative thinking.

Course Objective:

This course aims at imparting an understanding of:
Self and the process of self exploration
Learning strategies for development of a healthy self esteem
Importance of attitudes and their effect on work behaviour
Effective management of emotions and building interpersonal competence.

Course Contents:

Module I: Understanding Self
Formation of self concept
Dimension of Self
Components of self
Self Competency

Module II: Self-Esteem: Sense of Worth
Meaning and Nature of Self Esteem
Characteristics of High and Low Self Esteem
Importance & need of Self Esteem
Self Esteem at work
Steps to enhance Self Esteem

Module III: Emotional Intelligence: Brain Power
Introduction to EI
Difference between IQ, EQ and SQ
Relevance of EI at workplace
Self assessment, analysis and action plan

Module IV: Managing Emotions and Building Interpersonal Competence
Need and importance of Emotions
Healthy and Unhealthy expression of emotions
Anger: Conceptualization and Cycle
Developing emotional and interpersonal competence
Self assessment, analysis and action plan

Module V: Leading Through Positive Attitude
Understanding Attitudes
Formation of Attitudes
Types of Attitudes
Effects of Attitude on

Behaviour
Perception
Motivation
Stress
Adjustment
Time Management
Effective Performance
Building Positive Attitude

Module VI: End-of-Semester Appraisal

Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Examination Scheme:

Components	**SAP**	**A**	**Mid Term Test (CT)**	**VIVA**	**Journal for Success (JOS)**
Weightage (%)	20	05	20	30	25

Text & References:

- Towers, Marc: Self Esteem, 1st Edition 1997, American Media
- Pedler Mike, Burgoyne John, Boydell Tom, A Manager's Guide to Self-Development: Second edition, McGraw-Hill Book Company.
- Covey, R. Stephen: Seven habits of Highly Effective People, 1992 Edition, Simon & Schuster Ltd.
- Khera Shiv: You Can Win, 1st Edition, 1999, Macmillan
- Gegax Tom, Winning in the Game of Life: 1st Edition, Harmony Books
- Chatterjee Debashish, Leading Consciously: 1998 1st Edition, Viva Books Pvt. Ltd.
- Dr. Dinkmeyer Don, Dr. Losoncy Lewis, The Skills of Encouragement: St. Lucie Press.
- Singh, Dalip, 2002, Emotional Intelligence at work; First Edition, Sage Publications.
- Goleman, Daniel: Emotional Intelligence, 1995 Edition, Bantam Books
- Goleman, Daniel: Working with E.I., 1998 Edition, Bantam Books.

FRENCH

CODE	L	T	P/FW	CREDITS	SEMESTER
FLT 111	2	-	-	2	1

Course Learning Outcome

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts.
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self introduction, family description etc.

- To tell ones name and to spell it
- To understand the French keyboard
- To wish/welcome/identify/name someone
- To present oneself and someone else
- To fill a form
- To ask for information
- To understand and ask simple questions

Course Objective:

To familiarize the students with the French language

- with the phonetic system
- with the syntax
- with the manners
- with the cultural aspects

Course Contents:

Module A: pp. 01 to 37: Unités 1, 2, Unité 3 Objectif 1, 2

Only grammar of Unité 3: objectif 3, 4 and 5

Contenu lexical: Unité 1: Découvrir la langue française: (oral et écrit)

1. se présenter, présenter quelqu'un, faire la connaissance des autres, formules de politesse, rencontres
2. dire/interroger si on comprend
3. Nommer les choses

Unité 2: Faire connaissance

1.donner/demander des informations sur une personne, premiers contacts, exprimer ses goûts et ses préférences

2.Parler de soi: parler du travail, de ses activités, de son pays, de sa ville.

Unité 3: Organiser son temps

1. dire la date et l'heure

Contenu grammatical:

1. organisation générale de la grammaire
2. article indéfini, défini, contracté
3. nom, adjectif, masculin, féminin, singulier et pluriel

4. négation avec « de », "moi aussi", "moi non plus"
5. interrogation: Inversion, est-ce que, qui, que, quoi, qu'est-ce que, où, quand, comment, quel(s), quelle(s)
   Interro-négatif: réponses: oui, si, non
6. pronom tonique/disjoint- pour insister après une préposition
7. futur proche

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1

GERMAN

CODE	L	T	P/FW	CREDITS	SEMESTER
FLG 111	2	-	-	2	1

Course Learning Outcome

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts .
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self introduction, family description etc.

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.

To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany

Course Contents:

Module I: Introduction

Self introduction: heissen, kommen, wohnwn, lernen, arbeiten, trinken, etc.

All personal pronouns in relation to the verbs taught so far.

Greetings: Guten Morgen!, Guten Tag!, Guten Abend!, Gute Nacht!, Danke sehr!, Danke!, Vielen Dank!, (es tut mir Leid!),
Hallo, wie geht's?: Danke gut!, sehr gut!, prima!, ausgezeichnet!,
Es geht!, nicht so gut!, so la la!, miserabel!

Module II: Interviewspiel
To assimilate the vocabulary learnt so far and to apply the words and phrases in short dialogues in an interview – game for self introduction.

Module III: Phonetics
Sound system of the language with special stress on Dipthongs

Module IV: Countries, nationalities and their languages
To make the students acquainted with the most widely used country names, their nationalitie and the language spoken in that country.

Module V: Articles
The definite and indefinite articles in masculine, feminine and neuter gender. All Vegetables, Fruits, Animals, Furniture, Eatables, modes of Transport

Module VI: Professions
To acquaint the students with professions in both the genders with the help of the verb "sein".

Module VII: Pronouns
Simple possessive pronouns, the use of my, your, etc.
The family members, family Tree with the help of the verb "to have"

Module VIII: Colours
All the color and color related vocabulary – colored, colorful, colorless, pale, light, dark, etc.

Module IX: Numbers and calculations – verb "kosten"
The counting, plural structures and simple calculation like addition, subtraction, multiplication and division to test the knowledge of numbers.
"Wie viel kostet das?"

Module X: Revision list of Question pronouns
W – Questions like who, what, where, when, which, how, how many, how much, etc.

Examination Scheme:

Components	**CT1**	**CT2**	**C**	**I**	**V**	**A**
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH

CODE	L	T	P/FW	CREDITS	SEMESTER
FLS 111	2	-	-	2	1

Course Learning Outcome

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts .
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self introduction, family description etc.

Course Objective:

To enable students acquire the relevance of the Spanish language in today's global context, how to greet each other, how to present / introduce each other using basic verbs and vocabulary

Course Contents:

Module I

A brief history of Spain, Latin America, the language, the culture…and the relevance of Spanish language in today's global context.
Introduction to alphabets

Module II

Introduction to '*Saludos*' (How to greet each other. How to present / introduce each other).
Goodbyes (despedidas)
The verb *llamarse* and practice of it.

Module III

Concept of Gender and Number
Months of the years, days of the week, seasons. Introduction to numbers 1-100, Colors, Revision of numbers and introduction to ordinal numbers.

Module IV

Introduction to *SER* and *ESTAR* (both of which mean To Be).Revision of '*Saludos*' and '*Llamarse*'. Some adjectives, nationalities, professions, physical/geographical location, the fact that spanish adjectives have to agree with gender and number of their nouns. Exercises highlighting usage of *Ser* and *Estar*.

Module V

Time, demonstrative pronoun (Este/esta, Aquel/aquella etc)

Module VI

Introduction to some key AR /ER/IR ending regular verbs.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras

CHINESE

CODE	L	T	P/FW	CREDITS	SEMESTER
FLC 111	2	-	-	2	1

Course Learning Outcome

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts .
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self introduction, family description etc.

Course Objective:

There are many dialects spoken in China, but the language which will help you through wherever you go is Mandarin, or Putonghua, as it is called in Chinese. The most widely spoken forms of Chinese are Mandarin, Cantonese, Gan, Hakka, Min, Wu and Xiang. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I

Show pictures, dialogue and retell.
Getting to know each other.
Practicing chart with Initials and Finals. (CHART – The Chinese Phonetic Alphabet Called "Hanyu Pinyin" in Mandarin Chinese.)
Practicing of Tones as it is a tonal language.
Changes in 3rd tone and Neutral Tone.

Module II

Greetings
Let me Introduce
The modal particle "ne".
Use of Please 'qing" – sit, have tea …….. etc.
A brief self introduction – Ni hao ma? Zaijian!
Use of "bu" negative.

Module III

Attributives showing possession
How is your Health? Thank you
Where are you from?
A few Professions like – Engineer, Businessman, Doctor, Teacher, Worker.
Are you busy with your work?

May I know your name?

Module IV

Use of "How many" – People in your family?
Use of "zhe" and "na".
Use of interrogative particle "shenme", "shui", "ma" and "nar".
How to make interrogative sentences ending with "ma".
Structural particle "de".
Use of "Nin" when and where to use and with whom. Use of guixing.
Use of verb "zuo" and how to make sentences with it.

Module V

Family structure and Relations.
Use of "you" – "mei you".
Measure words
Days and Weekdays.
Numbers.
Maps, different languages and Countries.

Examination Scheme:

Components	**CT1**	**CT2**	**C**	**I**	**V**	**A**
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation, I – Interaction/Conversation Practice

Text & References:

"Elementary Chinese Reader Part I" Lesson 1-10

CYBER FORENSICS

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS201	2	1	-	3	2

Course Learning Outcome

1. Investigate different concepts of cyber forensics in terms of an individual, organization.
2. Create theories, methods and interpretations of theories within the field of Cyber forensics as well as solving theoretical and practical problems independently.
3. Apply his/her knowledge in new areas within field of cyber forensics.
4. Develop independently relevant methods in research and development in the field of Cyber forensics. These methods include literature study in area of cyber forensics and performing scientific experiments together with interpreting their result

Course Contents:

Module I: Computer Forensics Fundamentals

Introduction to Computer Forensics, Use of Computer Forensics in Law Enforcement, Stages of forensic investigation: Types of Computer Forensic Technology, Military, Law Enforcement, Business, Specialized Forensic Techniques; Types of Computer Forensics Systems: Internet Security, Intrusion Detection, Firewall Security , Public Key Infrastructure, Net Privacy, Identity Theft, Biometric Security Systems; .Data Recovery :Data Backup,-Recovery and Solution, Hiding and Recovering Hidden Data, Evidence Collection and Data Seizure, Types of Evidence: General Procedure, Collection and Archiving,

Module II: Mobile Forensics

Crime and mobile phones, evidences, forensic procedures, files present in SIM card, device data, external memory dump and evidences in memory card, operators systems Android forensics: Procedures for handling an android device, imaging android USB mass storage devices, logical and physical techniques.

Module III: Network Forensics

Collecting Network Based Evidence - Investigating Routers - Network Protocols - Email Tracing - Internet Fraud.

Module IV: Analysis of Digital Forensic Techniques

Digital forensics examination principles: Previewing, imaging, continuity, hashing and evidence locations- Seven element security model- developmental model of digital systems-audit and logs- Evidence interpretation: Data content and context.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Skoudis.E, Perlman. R. Counter Hack: "*A Step-by-Step Guide to Computer Attacks and Effective Defenses",* .Prentice Hall Professional Technical

References:

- Eoghan Casey, "Handbook Computer Crime Investigation's Forensic Tools and Technology", Academic Press, 1st Edition, 2001.
- Norbert Zaenglein, "Disk Detective: Secret You Must Know to Recover Information From a Computer", Paladin Press, 2000.

CYBER SECURITY - II

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS202	2	1	-	3	2

Course Learning Outcome

CLO1: Understand of how a cyber security principals & technology works, importance of data security and VPN and to understand the various techniques and strategies to improve the performance and security of an information system to maintain the core property of cyber security.

CLO 2: Comprehend the various cyber security threats to E-payments like ATM Machine, Threats associated with E-Wallet and recognize various cyber security attacks and how they happen to help design some form of counter measures to safeguard the security of the system.

CLO 3: Articulate the importance of secure information system, and the key elements of an information system as well as the scope and objectives of secure information system, implementation of different policies and standards.

CLO 4: Understand the basic challenges associated with cyber security as well as risk analysis, learn about the challenges associated with the evolution IOT, AI, and server less App security, ransomware etc.

MODULE- I : CYBER SECURITY PRINCIPLES AND TECHNOLOGY

Cyber Security Principles, Data Security Consideration, Firewalls, Types of Firewalls, Basics of Virtual Private Network, Basics of Intrusion Detection, Access Control, Digital Signature and Types of Digital Signature.

MODULE- II : THREATS AND ATTACKS IN E-PAYMENT

Introduction to E-Payment Security, Importance of Security in E- Payment, Common threats and attacks in E- Payment, Case Studies of Threats associated with E-Cash, Debit Card, Credit Card, Smart Card, ATM Machines, Mobile Payment, E-Wallet, Online Banking, SMS Banking.

MODULE- III : SECURE INFORMATION SYSTEM

Importance, Development of secure information system, Key Elements of an Information Security Policy – Purpose, Scope, Information Security Objectives, Security Awareness, Information Security Development Lifecycle.

MODULE- IV : CYBER SECURITY POLICES AND STANDARDS

Introduction to Security Policies, Need for Security Policy, Stakeholders of Policy Makers, Security Policy Audit, Security Policy Enforcement, Security Policy Awareness, Importance of Security Standards, ISO/IEC 27001 and 27002, NIST Cyber Security Framework, Common Criteria.

MODULE- V : CYBER SECURITY CHALLENGES AND RISK ANALYSIS

Introduction to Cyber Security Challenges, Challenges associated with the evolution of ransom ware, block chain, Internet of Things (IoT), Artificial Intelligence, Server less Apps, Security Analysis Benefits and Steps, Quantitative and Qualitative Security Risk Analysis.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text Books:

Charles J. Brooks, ,Christopher GrowPhilip Craig, "Cybersecurity Essentials", John Wiley .and Sons, 2018

MayankBhusan, Rajkumar Singh Rathore, AatifJamshed, Fundamental of Cyber Security: Principles, Theory and Practices, BPB Publications.

References:

Paul A. Watters, Cyber Security: Concepts and Cases, CreateSpace Independent Publishing Platform, 2012.

Peter W. Singer, Allan Friedman, Cybersecurity: What Everyone Needs to Know, Oxford University Press.

David Sutton, Cyber Security: A Practitioner's Guide, BCS Learning & Development Limited, 2017.

INTRUSION DETECTION SYSTEMS

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS203	2	1	-	3	2

Course Learning Outcome

CLO1: Understand the concept and definition of an IDS and its working methodology as well as its different types, different external threats to data and how we detect these by the help of IDS.

CLO 2:Comprehend the various types of IPS like network based, Protocol based as well as hybrid-based IDs. Learn about the intrusion analysis model, mapping of responses as well as different types of response from IPS.

CLO 3: Articulate the introduction and importance of SNORT, installation of SNORT and the different alert modes of SNORT. Students will also learn and understand the rules and option of SNORT and its working.

CLO 4: Understand the basic implementation of ACID with SNORT associated with IDS as well as learn about the different agents development for IDS, Students will also understand and learn about the architecture models of IDs and IPs

MODULE-I

History of Intrusion detection, Audit, Concept and definition , Internaland external threats to data, attacks, Need and types of IDS, Informationsources Host based information sources, Network based informationsources.

MODULE-II

Intrusion Prevention Systems, Network IDs protocol based IDs ,HybridIDs, Analysis schemes, thinking about intrusion. A model for intrusion analysis , techniquesResponses requirement of responses, types of responses mappingresponses to policy Vulnerability analysis, credential analysis noncredential analysis

MODULE-III

Introduction to Snort, Snort Installation Scenarios, Installing Snort,Running Snort on MultipleNetwork Interfaces, Snort Command Line Options. Step-By-StepProcedure to Compile andInstall Snort Location of Snort Files, Snort Modes Snort Alert Modes

MODULE-IV

Working with Snort Rules, Rule Headers, Rule Options, The SnortConfiguration File etc. Plugins, Preprocessors and Output Modules,Using Snort with MySQL

MODULE-V

Using ACID and Snort Snarf with Snort, Agent development forintrusion detection, Architecture models of IDs and IPs.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

TEXT BOOKS:

1. RafeeqRehman : " Intrusion Detection with SNORT, Apache,MySQL, PHP and ACID," 1st Edition, Prentice Hall , 2003.

REFERENCES:

1. Christopher Kruegel,FredrikValeur, Giovanni Vigna: "IntrusionDetection and Correlation Challenges and Solutions", 1st Edition,Springer, 2005.
2. Carl Endorf, Eugene Schultz and Jim Mellander " IntrusionDetection & Prevention", 1st Edition, Tata McGraw-Hill, 2004.
3. Stephen Northcutt, Judy Novak : "Network Intrusion Detection", 3rdEdition, New Riders Publishing, 2002.
4. T. Fahringer, R. Prodan, "A Text book on Grid ApplicationDevelopment and Computing Environment". 6th Edition,KhannaPublihsers, 2012.

CYBER SECURITY- II LAB

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS222	-	-	2	1	2

Course Learning Outcome

1. Investigate different concepts of firewall, IDs and IPs in terms of application, security or performance.

2. Articulate various cyber security threats to E-payments like ATM Machine, Threats associated with E-Wallet and recognize various cyber security attacks and how they happen to help design some form of counter measures to safeguard the security of the system.

3. Apply his/her knowledge in new areas within field of basic and advance system security and reactive approach to the security in a system and recognize various cyber security attacks and how they happen to help design some form of counter measures to safeguard the security of the system.

4. Audit of security policies and risk analysis, Evaluate Risk using Qualitative Risk Analysis tool.

Experiments

1. Implementation and Configuration of Firewall Using Windows Operating System.

2. Implementation and Configuration of Firewall Using Linux Operating System.

3. Check and Test your device with online Firewall

4. Implementation of Intrusion Detection and Presentation System using any tool in Windows / Linux Operating System

5. Payment gateway Integration using any language / tool.

6. Implementation and Quantification of Security using Security Development Lifecycle through Kali Linux

7. Perform Information Security Policy Audit Using tool / checklist.

8. Evaluate Risk using Qualitative Risk Analysis tool through Kali Linux

9. Evaluate Project Schedules Using Quantitative Risk Analysis tool.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

INTRUSION DETECTION SYSTEMS LAB

Course Code	L	T	P	Credit	SEMESTER
MCS 223	-	-	2	1	2

Course Learning Outcome

1. Investigate different concepts of firewall, IDs and IPs in terms of application, security or performance.

2. Articulate various cyber security threats to data and organization E-payments like DOS attack, session hijacking, DDoS attack, password guessing and password cracking, penetration testing.

3. Apply his/her knowledge in new areas within field of basic and advance system security and reactive approach to the security in a system and recognize various cyber security attacks and how they happen to help design some form of counter measures to safeguard the security of the system.

4. Understand and learn about the malware, keyloggers, countermeasures, Data packet sniffing web data extraction.

1. Working with Trojans, Backdoors and sniffer for monitoring network communication

2. Denial of Service and Session Hijacking using Tear Drop, DDOS attack.

3. Penetration Testing and justification of penetration testing through risk analysis

4. Password guessing and Password Cracking.

5. Wireless Network attacks , Bluetooth attacks

6. Firwalls , Intrusion Detection and Honeypots

7. Malware – Keylogger, Trojans, Keylogger countermeasures

8. Understanding Data Packet Sniffers

9. Windows Hacking – NT LAN Manager, Secure 1 password recovery

10. Implementing Web Data Extractor and Web site watcher.

Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

CYBER LAWS & SECURITY POLICIES

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS231	2	1	-	3	2

Course Learning Outcome

1. Make learner conversant with the social and intellectual property issues emerging from 'cyberspace.
2. Explore the legal and policy developments in various countries to regulate cyberspace
3. Develop the understanding of relationship between commerce and cyberspace; and
4. Give learners in depth knowledge of information technology act and legal frame work of right to privacy, data security and data protection.
5. Make study on various case studies on real time crimes.

Module I: Information Technology Law

The Information Technology Legal Framework in India, Cyber Crime, Digital Evidence, Technological Standards under the Information Technology Law, Liability of companies under the Information Technology Act, Recent amendments by the IT (Amendment Act) 2008, ActSection66(A, B, C, D, E, F),ITActSection67 (A, B, C).
Security Investigation-Legal, Ethical and Professional Issues.

Module II

Overview of IT Act, 2000, Amendments and Limitations of IT Act, Digital Signatures, Cryptographic Algorithm, Public Cryptography, Private Cryptography, Electronic Governance,Legal Recognition of Electronic Records, Legal Recognition of Digital Signature Certifying Authorities, Cyber Crime and Offences, Network Service Providers Liability, Cyber Regulations Appellate Tribunal, Penalties and Adjudication.

Module III Cyber law and related Legislation :

Patent Law, Trademark Law, Copyright, Software – Copyright or Patented, Domain Names and Copyright disputes, Electronic Data Base and its Protection, IT Act and Civil Procedure Code, IT Act and Criminal Procedural Code, Relevant Sections of Indian Evidence Act, Relevant Sections of Bankers Book Evidence Act, Relevant Sections of Indian Penal Code, Relevant Sections of Reserve Bank of India Act, Law Relating To Employees And Internet, Alternative Dispute Resolution , Online Dispute Resolution (ODR).

Module IV Electronic Business and legal issues:

Evolution and development in Ecommerce, paper vs paper less contracts E-Commerce models-B2B, B2C,E security. Application area: Business, taxation, electronic payments, supplychain, EDI, E-markets, Emerging Trends.

Module V Case Study On Cyber Crimes:

Harassment Via E-Mails, Email Spoofing (Online A Method Of Sending E-Mail Using A False Name Or E-Mail Address To Make It Appear That The E-Mail Comes From Somebody Other Than The True Sender, Cyber Pornography (Exm.MMS),Cyber-Stalking.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

TEXT BOOKS :

1 .K.Kumar," Cyber Laws: Intellectual property & E Commerce, Security",1 st Edition, Dominant Publisher,2011.

2. Rodney D. Ryder, " Guide To Cyber Laws", Second Edition, Wadhwa And Company, New Delhi, 2007.

3. Information Security policy &implementation Issues, NIIT, PHI.

REFERENCES :

1. Vakul Sharma, "Handbook Of Cyber Laws" Macmillan India Ltd, 2 nd Edition,PHI,2003.

2. Justice Yatindra Singh, " Cyber Laws", Universal Law Publishing,1stEdition,New Delhi, 2003.

3. Sharma, S.R., "Dimensions Of Cyber Crime", Annual PublicationsPvt. Ltd., 1st Edition, 2004.

4. Augastine, Paul T.," Cyber Crimes And Legal Issues", CrecentPublishing Corporation, 2007.

SOCIAL MEDIA SECURITY

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS232	2	1	-	3	2

Course Learning Outcome

1. Analyze social media security issues.
2. Develop policies and procedures to manage social media security risks.
3. Evaluate and communicate the human role in social media security systems with an emphasis on ethics, social engineering vulnerabilities and training.
4. Interpret and forensically investigate social media security incidents.

Module I

Introduction to Online Social Networks, data collection from social networks, challenges, opportunities, and pitfalls in online social networks, APIs.

Module II

Collecting data from Online Social Media, Trust, and credibility.

Module III

Reputations in social systems, Online social Media and Policing.

Module IV

Information privacy disclosure, revelation and its effects in OSM and online social networks.

Module V

Phishing in OSM & Identifying fraudulent entities in online social networks.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

BIOMETRIC SECURITY

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS233	2	1	-	3	2

Course Learning Outcome

1. Investigate their strengths and personal insights to be revealed in a Formal Setup of Communication.

2. Create right selection of words and ideas while also choosing the appropriate networking channel for formal communication

3. Apply their acquired knowledge with the appropriate selection of channel of formal communication.

4. Develop and empower self with the power of Words.

5. Enhance their technical writing capabilities while also learning about do's and don'ts of technical drafting.

MODULE-I

Biometrics- Introduction- benefits of biometrics over traditionalauthentication systems – benefitsof biometrics in identification systems-selecting a biometric for a system– Applications – Keybiometric terms and processes - biometric matching methods –Accuracyin biometric systems.

MODULE-II

Physiological Biometric Technologies: Fingerprints – Technicaldescription –characteristics - Competing technologies - strengths –weaknesses – deployment - Facial scan - Technical description -characteristics - weaknesses-deployment - Iris scan – Technicaldescription – characteristics - strengths – weaknesses – deployment- Retina vascular pattern

MODULE-III

Technical description – characteristics - strengths – weaknesses –deployment - Hand scan - Technical description-characteristics -strengths – weaknesses deployment – DNA biometrics.Behavioral Biometric Technologies: Handprint Biometrics – DNABiometrics.

MODULE-IV

signature and handwriting technology - Technical description –classification – keyboard / keystroke dynamics- Voice – dataacquisition - feature extraction - characteristics - strengths – weaknesses-deployment.

MODULE-V

Multi biometrics and multi factor biometrics - two-factor authenticationwith passwords - tickets and tokens – executive decision -implementation plan.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

TEXT BOOKS:

1. Samir Nanavathi, Michel Thieme, and Raj Nanavathi : "Biometrics-Identity verification in a network", 1st Edition, Wiley Eastern, 2002.

2. John Chirillo and Scott Blaul : “Implementing BiometricSecurity”, 1st Edition, Wiley Eastern Publication, 2005.

REFERENCES:

1. John Berger: “Biometrics for Network Security”, 1st Edition,Prentice Hall, 2004.

MATLAB

Course Code	L	T	P	Credit	SEMESTER
MCS 234	2	1	-	3	2

Course Learning Outcome

1. Ability to express programming & simulation for Computer Science problems as well as basic

Mathematical problems in MATLAB.

2. Recognize the procedures, algorithms, and concepts require solving specific problems.

3. Articulate importance of software's in research by simulation work..

4. Code solutions to problems in MATLAB, in a legible, debuggable and efficient way.

Course Contents:

Module I: Introduction

Basic Features, Starting MAT Lab, Using MAT Lab, Quitting Mat lab, Creating MATLAB variables, Overwriting variable, Error messages, Making corrections, Managing the workspace, Keeping track of your work session, Entering multiple statements per line.

Module II: Basic Plotting

overview, Creating simple plots, Adding titles, axis labels, and annotations, Multiple data sets in one plot, Specifying line styles and colors, Matrix generation, Array operations and Linear equations, Matrix arithmetic operations, Array arithmetic operations ,Solving linear equations, Matrix inverse.

Module III: Introduction to programming in MATLAB

Introduction, M-File Scripts, Script side-effects, M-File functions, Anatomy of a M-File function, Input and output arguments, Input to a script file.

Module IV: Control Flow and operators

Introduction, Control Flow, The ``if...end" structure , Relational and logical operators , The ``for...end" loop , The ``while...end" loop, Other Flow structures , Operator precedence

Module V: Debugging M-Files

Introduction , Debugging process, Preparing for debugging , Setting breakpoints, Running with breakpoints , Examining values, Correcting and ending debugging, Ending debugging, Correcting an M-File . .

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

WIRELESS NETWORKS

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS235	2	1	-	3	2

Course Learning Outcome

CLO 1 Recognize the wireless networking techniques

CLO 2 Identify the tools wireless networking frequency and management

CLO 3 Describe the concept of wireless networking multiple access technique and its principles

CLO 4 Apply knowledge of wireless networking to implement and design new effective methods

Module I:

Wireless Networks: Wireless Network, Wireless Network Architecture, Wireless Switching Technology, Wireless Communication problem, Wireless Network Reference Model, Wireless Networking Issues & Standards.

Module II:

Wireless LAN: Infrared Vs radio transmission, Infrastructure and Ad-hoc Network, IEEE 802.11:System Architecture, Protocol Architecture, 802.11b, 802.11a, Bluetooth: User Scenarios, Architecture.

Module III:

Global System for Mobile Communications (GSM): Mobile Services, System Architecture, Protocols, Localization & Calling, Handover, Security. GPRS: GPRS System, Architecture, UMTS: UMTS System Architecture. LTE: Long Term Evolution.

Module IV

Mobile Computing: Mobile communication, Mobile computing, Mobile Computing Architecture, Mobile Devices, Mobile System Networks, Mobility Management, Mobile Network Layer: Mobile IP: Goals, Assumptions, Entities and Terminology, IP Packet Delivery, Agent Discovery, Registration, Tunneling and Encapsulation, Optimizations, Dynamic Host Configuration Protocol (DHCP)

Module V

Implementation of wireless network through cisco packet tracer, create network topologies ,IP addressing type and subnet mask, address management , routing and switching configuration, wired and wireless network configuration, VLAN configuration, wireless router and AP configuration, Security implementation.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE

Weightage (%)	15	10	10	10	5	50

TEXT BOOKS:

1. Schiller, J. 2008. Mobile Communications. 2nd ed. India: Pearson Education.
2. Kumar,S. and Kakkasageri, M. S. "Wireless and Mobile Networks: Concepts and Protocols", Wiley India.
3. Kamal R. 2011. "Mobile Computing", 2nd Ed.Oxford University Press.

REFERENCES:

1. Talukder, A. K., Ahmed, H. andYavagal,R. R. 2010.Mobile Computing: Technology, Applications and Service Creation, 2 nd Ed. Tata McGraw Hill.
2. Gast, M. S. "802.11 Wireless Networks: The Definitive Guide", O'Reilly Media.

MATLAB LAB

Course Code	L	T	P	Credit	SEMESTER
MCS 244	-	-	2	1	2

Course Learning Outcome

1) To impart basic knowledge of MAT LAB.

2) To study the MAT LAB operations and coding.

3) To develop the concept of search Analysis and Knowledge representation through logic.

Learning outcomes :

After completion of the course the student will be able to :

1) Understand the basics of MAT LAB.
2) Solve the problems under analysis like heuristic search etc.,
3) To Programme how to analyze the error concepts and their importance.
4) Apply different types of logics and their procedures for problem solving.
5) Solve complex problems using knowledge.
6) Understand what exact the Uncertainty learning is.

Course Contents:

1. Characteristics of MATLAB
2. Introduction to MATLAB
3. Understand the graphical interface to the MATLAB workspace.
4. Gettingstartedwith MATLAB by creating variables, Arithmeticoperations etc.,
5. Executing the Mathematical expressions.
6. Creating simple plots.
7. Matrix Generation.
8. Array Operations and linearequationwith MATLAB
9. Basic Programmingwith MATLAB
10. Debugging M- Files

Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

WIRELESS NETWORKS LAB

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS245	-	-	2	1	2

Course Learning Outcome

CLO 1 Recognize the wireless networking techniques

CLO 2 Identify the tools wireless networking frequency and management

CLO 3 Describe the concept of wireless networking multiple access technique and its principles

CLO 4 Apply knowledge of wireless networking to implement and design new effective methods

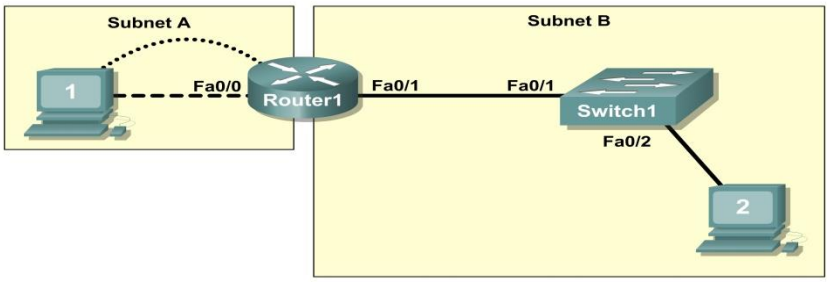
List of Experiments

Lab I: Review of Concepts from Exploration - I

- Create a logical topology given network requirements
- Create subnets to meet host requirements
- Configure the physical topology
- Configure the logical topology
- Verify network connectivity
- Configure and verify passwords

Lab II: Troubleshooting a Small Network

Topology Diagram



- Verify that a paper design meets stated network requirements
- Cable a network according to the topology diagram
- Erase the startup configuration and reload a router to the default state
- Load the routers with supplied scripts
- Discover where communication is not possible
- Gather information about the misconfigured portion of the network along with any other errors
- Analyze information to determine why communication is not possible
- Propose solutions to network errors
- Implement solutions to network errors

Examine the Logical LAN Topology

The IP address block of 172.16.30.0 /23 is subnetted to meet the following requirements:

Subnet	Number of Hosts
Subnet A	174
Subnet B	60

Additional requirements and specifications:

- The 0 subnet is used.
- The smallest possible number of subnets that satisfy the requirements for hosts should be used, keeping the largest possible block in reserve for future use.
- Assign the first usable subnet to Subnet A.
- Host computers use the first IP address in the subnet. The network router uses the last network host address.

Based on these requirements, the following topology has been provided to you:

Subnet A	
Specification	**Value**
IP mask (decimal)	255.255.255.0
IP address	172.16.30.0
First IP host address	172.16.30.1
Last IP host address	172.16.30.254
Subnet B	
Specification	**Value**
IP mask (decimal)	255.255.255.128
IP address	172.16.31.0
First IP host address	172.16.31.1
Last IP host address	172.16.31.126

Examine each of the values in the tables above and verify that this topology meets all requirements and specifications. Are any of the given values incorrect? _____

If yes, correct the values in the table above and write the corrected values below:

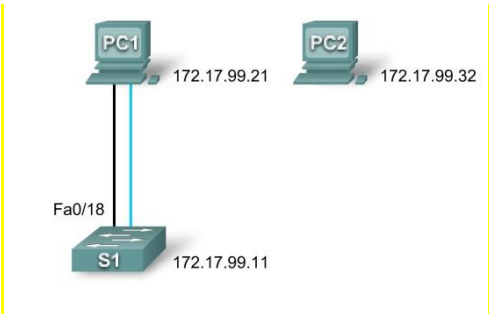
_____

_____

Create a configuration table similar to the one below using your corrected values:

Device	IP address	Mask	Gateway
Host1	172.16.30.1	255.255.255.0	172.16.30.254
Router1–Fa0/0	172.16.30.254	255.255.255.0	N/A
Host2	172.16.31.1	255.255.255.128	172.16.31.126
Router1–Fa0/1	172.16.31.126	255.255.255.128	N/A

Lab III: Basic Switch Configuration



Addressing Table

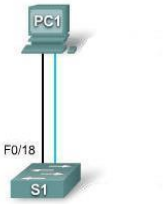
Device	Interface	IP Address	Subnet Mask	Default Gateway
PC1	**NIC**	172.17.99.21	255.255.255.0	172.17.99.1
PC2	**NIC**	172.17.99.32	255.255.255.0	172.17.99.1
S1	**VLAN99**	172.17.99.11	255.255.255.0	172.17.99.1

Learning Objectives

Cable a network according to the topology diagram
Clear an existing configuration on a switch
Examine and verify the default configuration
Create a basic switch configuration, including a name and an IP address
Configure passwords to ensure that access to the CLI is secured
Configure switch port speed and duplex properties for an interface
Configure basic switch port security
Manage the MAC address table
Assign static MAC addresses
Add and move hosts on a switch

Lab IV: Managing Switch Operating System and Configuration Files

Topology Diagram



Addressing Table

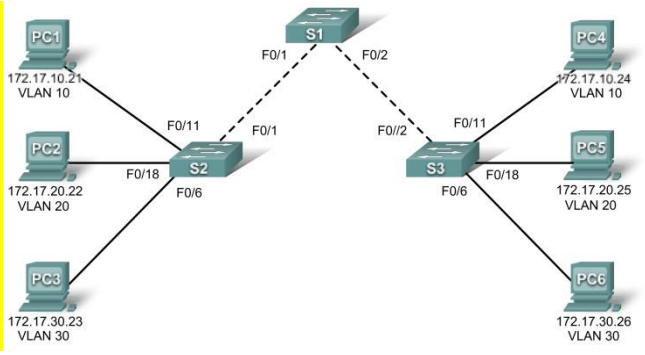
Device	Hostname	Interface	IP Address	Subnet Mask	Default Gateway
PC1	Host-A	NIC	172.17.99.21	255.255.255.0	172.17.99.1
S1	ALSwitch	VLAN99	172.17.99.11	255.255.255.0	172.17.99.1

Learning Objectives

Create and save a basic switch configuration
Set up a TFTP server on the network
Back up the switch Cisco IOS software to a TFTP server and then restore it
Back up the switch configuration to a TFTP server
Configure a switch to load a configuration from a TFTP server
Upgrade the Cisco IOS software from a TFTP server

Lab V: Basic VLAN Configuration

Topology Diagram



Addressing Table

Device (Hostname)	Interface	IP Address	Subnet Mask	Default Gateway
S1	**VLAN 99**	172.17.99.11	255.255.255.0	N/A
S2	**VLAN 99**	172.17.99.12	255.255.255.0	N/A
S3	**VLAN 99**	172.17.99.13	255.255.255.0	N/A
PC1	**NIC**	172.17.10.21	255.255.255.0	172.17.10.1
PC2	**NIC**	172.17.20.22	255.255.255.0	172.17.20.1
PC3	**NIC**	172.17.30.23	255.255.255.0	172.17.30.1
PC4	**NIC**	172.17.10.24	255.255.255.0	172.17.10.1
PC5	**NIC**	172.17.20.25	255.255.255.0	172.17.20.1
PC6	**NIC**	172.17.30.26	255.255.255.0	172.17.30.1

Initial Port Assignments (Switches 2 and 3)

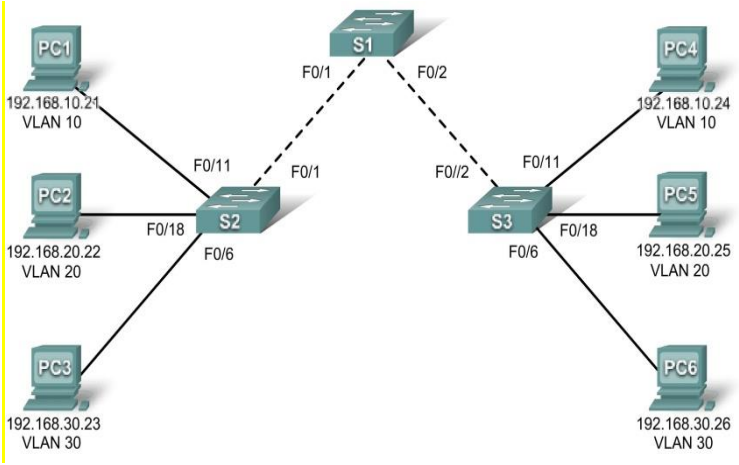
Ports	Assignment	Network
Fa0/1 – 0/5	802.1q Trunks (Native VLAN 99)	172.17.99.0 /24
Fa0/6 – 0/10	VLAN 30 – Guest (Default)	172.17.30.0 /24
Fa0/11 – 0/17	VLAN 10 – Faculty/Staff	172.17.10.0 /24
Fa0/18 – 0/24	VLAN 20 – Students	172.17.20.0 /24

Learning Objectives

Cable a network according to the topology diagram
Erase the startup configuration and reload a switch to the default state
Perform basic configuration tasks on a switch
Create VLANs
Assign switch ports to a VLAN
Add, move, and change ports
Verify VLAN configuration
Enable trunking on inter-switch connections
Verify trunk configuration
Save the VLAN configuration

Lab VI: Troubleshooting VLAN Configurations

Topology Diagram



Addressing Table

Device (Hostname)	Interface	IP Address	Subnet Mask	Default Gateway
S1	**VLAN 56**	192.168.56.11	255.255.255.0	N/A
S2	**VLAN 56**	192.168.56.12	255.255.255.0	N/A
S3	**VLAN 56**	192.168.56.13	255.255.255.0	N/A
PC1	**NIC**	192.168.10.21	255.255.255.0	192.168.10.1
PC2	**NIC**	192.168.20.22	255.255.255.0	192.168.20.1
PC3	**NIC**	192.168.30.23	255.255.255.0	192.168.30.1
PC4	**NIC**	192.168.10.24	255.255.255.0	192.168.10.1
PC5	**NIC**	192.168.20.25	255.255.255.0	192.168.20.1
PC6	**NIC**	192.168.30.26	255.255.255.0	192.168.30.1

Initial Port Assignments (Switches 2 and 3)

Ports	Assignment	Network
Fa0/1 – 0/5	802.1q Trunks (Native VLAN 56)	192.168.56.0 /24
Fa0/6 – 0/10	VLAN 30 – Guest (Default)	192.168.30.0 /24
Fa0/11 – 0/17	VLAN 10 – Faculty/Staff	192.168.10.0 /24
Fa0/18 – 0/24	VLAN 20 – Students	192.168.20.0 /24

In this lab, you will practice troubleshooting a misconfigured VLAN environment. Load or have your instructor load the configurations below into your lab gear. Your objective is to locate and correct any and all errors in the configurations and establish end-to-end connectivity. Your final configuration should match the topology diagram and addressing table. All passwords are set to **cisco**, except the enable secret password, which is set to **class**.

Task 1: Prepare the Network

Step 1: Cable a network that is similar to the one in the topology diagram.

Step 2: Clear any existing configurations on the switches, and initialize all ports in the shutdown state.

Step 3: Import the configurations below.

Switch 1

hostname S1

no ip domain-lookup

```
enable secret class
!
!
interface range FastEthernet0/1-5
 switchport mode trunk
!
interface range FastEthernet0/6-24
 shutdown
!
interface Vlan1
 no ip address
 no ip route-cache
!
interface Vlan56
 ip address 192.168.56.11 255.255.255.0
 no ip route-cache
!
line con 0
 logging synchronous
line vty 0 4
 no login
line vty 5 15
 password cisco
 login
!
end
```

Switch 2

```
hostname S2
no ip domain-lookup
enable secret class
!
vlan 10,20,30,56
!
interface range FastEthernet0/1-5
 switchport trunk native vlan 56
 switchport mode access
!
interface range FastEthernet0/6-10
 switchport access vlan 30
 switchport mode access
!
interface range FastEthernet0/11-17
 switchport access vlan 10
 switchport mode access
!
interface range FastEthernet0/18-24
 switchport access vlan 20
 switchport mode access
```

```
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 ip address 192.168.56.12 255.255.255.0
 no ip route-cache
 shutdown
!
line con 0
 password cisco
 login
line vty 0 4
 password cisco
 login
line vty 5 15
 password cisco
 login
!
end
```

Switch 3

```
hostname S3
no ip domain-lookup
enable secret class
!
vlan 10,20,30
!
interface range FastEthernet0/1-5
 switchport trunk native vlan 56
 switchport mode trunk
!
interface range FastEthernet0/6-10
 switchport mode access
!
interface range FastEthernet0/11-17
 switchport mode access
!
interface range FastEthernet0/18-24
 switchport mode access
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
```

```
 no ip route-cache
 shutdown
!
interface Vlan56
 no ip route-cache
!
line con 0
 password cisco
 login
line vty 0 4
 password cisco
 login
line vty 5 15
 password cisco
 login
!
End
```

Task 2: Troubleshoot and Repair the VLAN Configuration

Task 3: Document the Switch Configurations

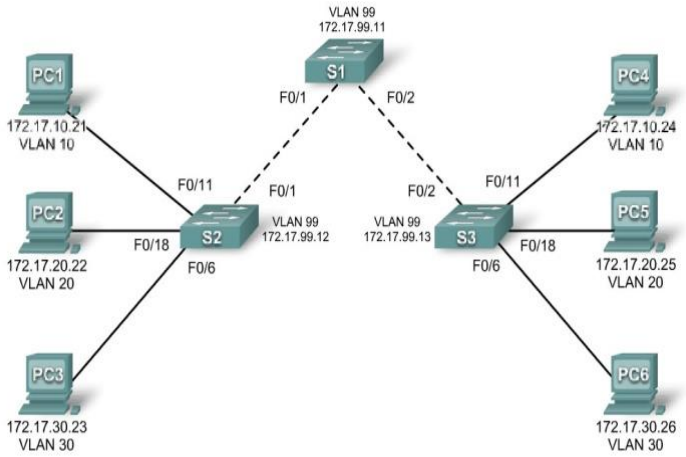
On each switch, capture the running configuration to a text file and save for future reference:

Task 4: Clean Up

Erase the configurations and reload the switches. Disconnect and store the cabling. For PC hosts that are normally connected to other networks (such as the school LAN or to the Internet), reconnect the appropriate cabling and restore the TCP/IP settings.

Lab VII: Basic VTP Configuration

Topology Diagram



Addressing Table

Device (Hostname)	Interface	IP Address	Subnet Mask	Default Gateway

S1	**VLAN 99**	172.17.99.11	255.255.255.0	N/A
S2	**VLAN 99**	172.17.99.12	255.255.255.0	N/A
S3	**VLAN 99**	172.17.99.13	255.255.255.0	N/A
PC1	**NIC**	172.17.10.21	255.255.255.0	172.17.10.1
PC2	**NIC**	172.17.20.22	255.255.255.0	172.17.20.1
PC3	**NIC**	172.17.30.23	255.255.255.0	172.17.30.1
PC4	**NIC**	172.17.10.24	255.255.255.0	172.17.10.1
PC5	**NIC**	172.17.20.25	255.255.255.0	172.17.20.1
PC6	**NIC**	172.17.30.26	255.255.255.0	172.17.30.1

Port Assignments (Switches 2 and 3)

Ports	Assignment	Network
Fa0/1 – 0/5	802.1q Trunks (Native VLAN 99)	172.17.99.0 /24
Fa0/6 – 0/10	VLAN 30 – Guest (Default)	172.17.30.0 /24
Fa0/11 – 0/17	VLAN 10 – Faculty/Staff	172.17.10.0 /24
Fa0/18 – 0/24	VLAN 20 – Students	172.17.20.0 /24

Learning Objectives

Cable a network according to the topology diagram

Erase the startup configuration and reload a switch to the default state

Perform basic configuration tasks on a switch

Configure VLAN Trunking Protocol (VTP) on all switches

Enable trunking on inter-switch connections

Verify trunk configuration

Modify VTP modes and observe the impact

Create VLANs on the VTP server, and distribute this VLAN information to switches in the network

Explain the differences in operation between VTP transparent mode, server mode, and client mode

Assign switch ports to the VLANs

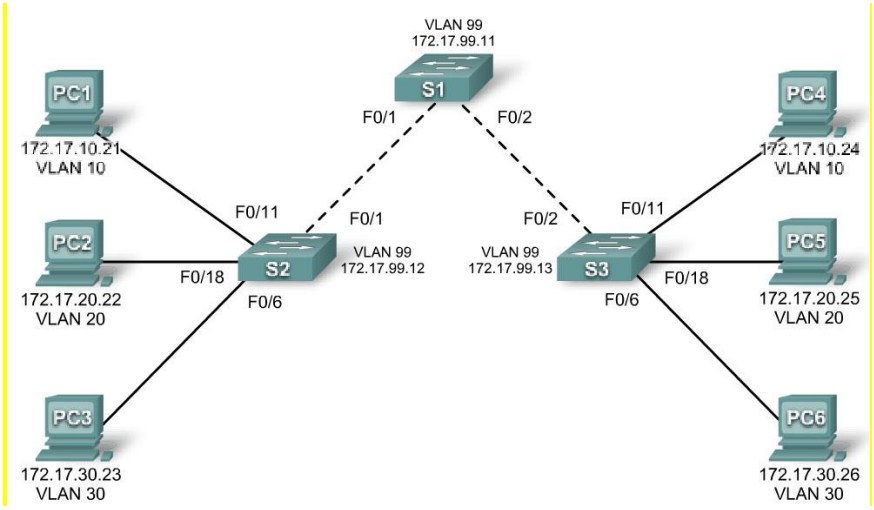
Save the VLAN configuration

Enable VTP pruning on the network

Explain how pruning reduces unnecessary broadcast traffic on the LAN

Lab VIII: Troubleshooting VTP Configuration

Topology Diagram



Addressing Table

Device (Hostname)	Interface	IP Address	Subnet Mask
S1	**VLAN 99**	172.17.99.11	255.255.255.0
S2	**VLAN 99**	172.17.99.12	255.255.255.0
S3	**VLAN 99**	172.17.99.13	255.255.255.0
PC1	**NIC**	172.17.10.21	255.255.255.0
PC2	**NIC**	172.17.20.22	255.255.255.0
PC3	**NIC**	172.17.30.23	255.255.255.0
PC4	**NIC**	172.17.10.24	255.255.255.0
PC5	**NIC**	172.17.20.25	255.255.255.0
PC6	**NIC**	172.17.30.26	255.255.255.0

Port Assignments (Switches 2 and 3)

Ports	Assignment	Network
Fa0/1 – 0/5	802.1q Trunks (Native VLAN 99)	172.17.99.0 /24
Fa0/6 – 0/10	VLAN 30 – Guest (Default)	172.17.30.0 /24
Fa0/11 – 0/17	VLAN 10 – Faculty/Staff	172.17.10.0 /24
Fa0/18 – 0/24	VLAN 20 – Students	172.17.20.0 /24

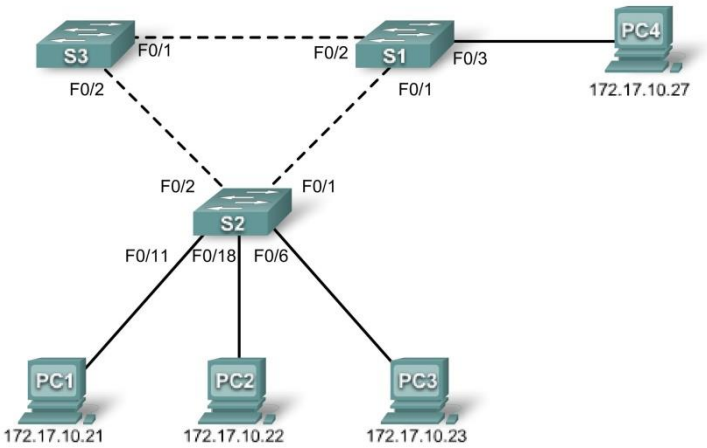
Objectives

Upon completion of this lab, you will be able to:

- Cable a network according to the topology diagram
- Erase the startup configuration and vlan.dat files and reload switches to the default state
- Load the switches with supplied scripts
- Find and correct all configuration errors
- Document the corrected network

Lab IX: Basic Spanning Tree Protocol

Topology Diagram



Addressing Table

Device (Hostname)	Interface	IP Address	Subnet Mask	Default Gateway
S1	**VLAN 1**	172.17.10.1	255.255.255.0	N/A
S2	**VLAN 1**	172.17.10.2	255.255.255.0	N/A
S3	**VLAN 1**	172.17.10.3	255.255.255.0	N/A
PC1	**NIC**	172.17.10.21	255.255.255.0	172.17.10.254
PC2	**NIC**	172.17.10.22	255.255.255.0	172.17.10.254
PC3	**NIC**	172.17.10.23	255.255.255.0	172.17.10.254
PC4	**NIC**	172.17.10.27	255.255.255.0	172.17.10.254

Learning Objectives

Cable a network according to the topology diagram

Erase the startup configuration and reload the default configuration, setting a switch to the default state

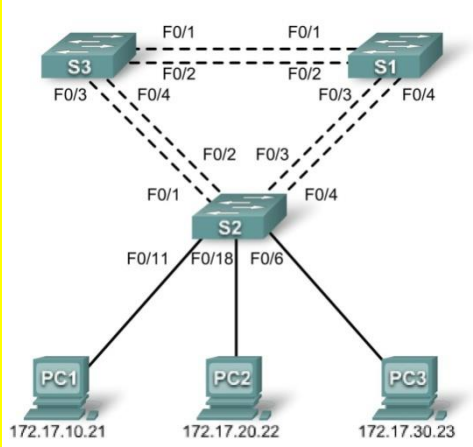
Perform basic configuration tasks on a switch

Observe and explain the default behavior of Spanning Tree Protocol (STP, 802.1D)

Observe the response to a change in the spanning tree topology

Lab X: Troubleshooting Spanning Tree Protocol

Topology Diagram



Addressing Table

Device (Hostname)	Interface	IP Address	Subnet Mask	Default Gateway
S1	**VLAN 99**	172.17.99.11	255.255.255.0	N/A
S2	**VLAN 99**	172.17.99.12	255.255.255.0	N/A
S3	**VLAN 99**	172.17.99.13	255.255.255.0	N/A
PC1	**NIC**	172.17.10.21	255.255.255.0	172.17.10.1
PC2	**NIC**	172.17.20.22	255.255.255.0	172.17.20.1
PC3	**NIC**	172.17.30.23	255.255.255.0	172.17.30.1

Port Assignments – Switch 2

Ports	Assignment	Network
Fa0/1 – 0/4	802.1q Trunks (Native VLAN 99)	172.17.99.0 /24
Fa0/5 – 0/10	VLAN 30 – Guest (Default)	172.17.30.0 /24
Fa0/11 – 0/17	VLAN 10 – Faculty/Staff	172.17.10.0 /24
Fa0/18 – 0/24	VLAN 20 – Students	172.17.20.0 /24

Learning Objectives

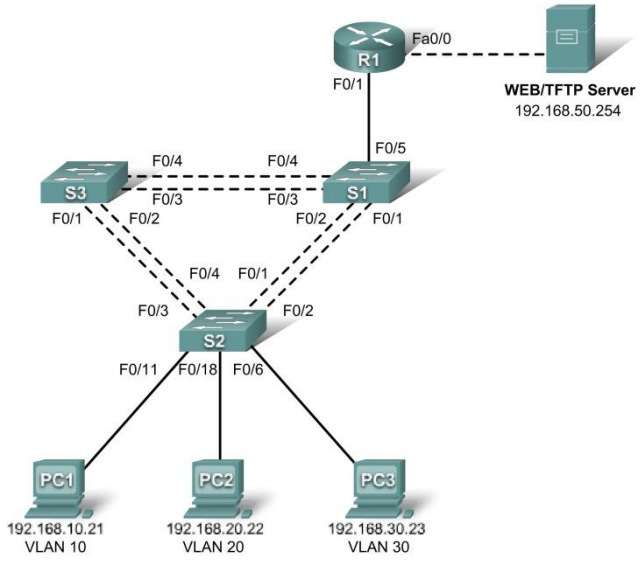
Analyze a congestion problem in a redundant, switched LAN network.
Recognize the capabilities for per-VLAN load balancing with PVST.
Modify the default STP configuration to optimize available bandwidth.
Verify that modifications have had the intended effect.

You are responsible for the operation of the redundant switched LAN shown in the topology diagram. You and your users have been observing increased latency during peak usage times, and your analysis points to congested trunks. You recognize that of the six trunks configured, only two are forwarding packets in the default STP configuration currently running. The solution to this problem requires more effective use of the available trunks. The PVST+ feature of Cisco switches provides the required flexibility to distribute the inter-switch traffic using all six trunks.

This lab is complete when all wired trunks are carrying traffic, and all three switches are participating in per-VLAN load balancing for the three user VLANs.

Lab XI: Inter-VLAN Routing

Topology Diagram



Addressing Table

Device (Hostname)	Interface	IP Address	Subnet Mask	Default Gateway
S1	**VLAN 99**	192.168.99.11	255.255.255.0	192.168.99.1
S2	**VLAN 99**	192.168.99.12	255.255.255.0	192.168.99.1
S3	**VLAN 99**	192.168.99.13	255.255.255.0	192.168.99.1
R1	**Fa 0/0**	192.168.50.1	255.255.255.0	N/A
R1	**Fa 0/1**	See Subinterface Configuration Table		N/A
PC1	**NIC**	192.168.10.21	255.255.255.0	192.168.10.1
PC2	**NIC**	192.168.20.22	255.255.255.0	192.168.20.1
PC3	**NIC**	192.168.30.23	255.255.255.0	192.168.30.1
Server	**NIC**	192.168.50.254	255.255.255.0	192.168.50.1

Port Assignments – Switch 2

Ports	Assignment	Network
Fa0/1 – 0/5	802.1q Trunks (Native VLAN 99)	192.168.99.0 /24
Fa0/6 – 0/10	VLAN 30 – Sales	192.168.30.0 /24
Fa0/11 – 0/17	VLAN 10 – R&D	192.168.10.0 /24
Fa0/18 – 0/24	VLAN 20 – Engineering	192.168.20.0 /24

Subinterface Configuration Table – Router 1

Router Interface	Assignment	IP Address
Fa0/1.1	VLAN1	192.168.1.1
Fa0/1.10	VLAN 10	192.168.10.1
Fa0/1.20	VLAN 20	192.168.20.1
Fa0/1.30	VLAN 30	192.168.30.1
Fa0/1.99	VLAN 99	192.168.99.1

Learning Objectives

Upon completion of this lab, you will be able to to:

Cable a network according to the topology diagram

Clear configurations and reload a switch and a router to the default state

Perform basic configuration tasks on a switched LAN and a router

Configure VLANs and VLAN Trunking Protocol (VTP) on all switches

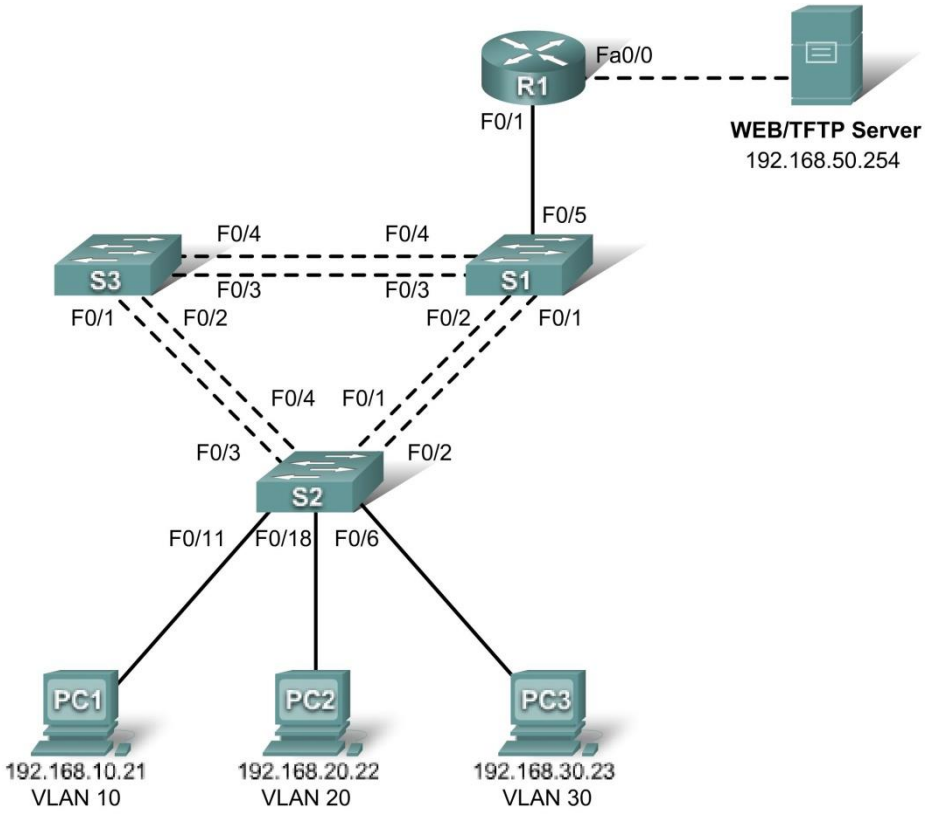
Configure a router to support 802.1q trunking on a Fast Ethernet interface

Configure a router with subinterfaces corresponding to the configured VLANs

Demonstrate inter-VLAN routing

Lab XII: Troubleshooting Inter-VLAN Routing

Topology Diagram



Addressing Table

Device (Hostname)	Interface	IP Address	Subnet Mask	Default Gateway
S1	**VLAN 99**	192.168.99.11	255.255.255.0	192.168.99.1
S2	**VLAN 99**	192.168.99.12	255.255.255.0	192.168.99.1
S3	**VLAN 99**	192.168.99.13	255.255.255.0	192.168.99.1
R1	**Fa 0/0**	192.168.50.1	255.255.255.0	N/A
R1	**Fa 0/1**	See Subinterface Configuration Table		N/A
PC1	**NIC**	192.168.10.21	255.255.255.0	192.168.10.1
PC2	**NIC**	192.168.20.22	255.255.255.0	192.168.20.1
PC3	**NIC**	192.168.30.23	255.255.255.0	192.168.30.1
Server	**NIC**	192.168.50.254	255.255.255.0	192.168.50.1

Port Assignments – Switch 2

Ports	Assignment	Network
Fa0/1 – 0/5	802.1q Trunks (Native VLAN 99)	192.168.99.0 /24
Fa0/6 – 0/10	VLAN 30 – Sales	192.168.30.0 /24
Fa0/11 – 0/17	VLAN 10 – R&D	192.168.10.0 /24
Fa0/18 – 0/24	VLAN 20 – Engineering	192.168.20.0 /24

Subinterface Configuration Table – Router 1

Router Interface	Assignment	IP Address
Fa0/1.1	VLAN1	192.168.1.1
Fa0/1.10	VLAN 10	192.168.10.1
Fa0/1.20	VLAN 20	192.168.20.1
Fa0/1.30	VLAN 30	192.168.30.1

Fa0/1.99	VLAN 99	192.168.99.1

Learning Objectives

To complete this lab:

- Cable a network according to the topology diagram
- Erase any existing configurations and reload switches and the router to the default state
- Load the switches and the router with supplied scripts
- Find and correct all configuration errors
- Document the corrected network

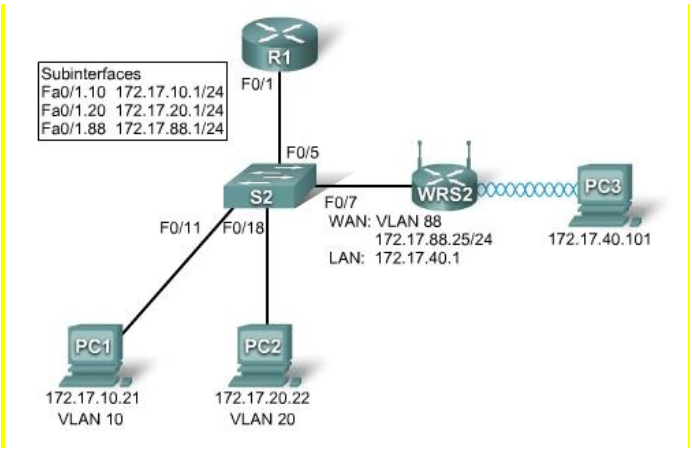
Scenario

The network has been designed and configured to support five VLANs and a separate server network. Inter-VLAN routing is being provided by an external router in a router-on-a-stick configuration, and the server network is routed across a separate Fast Ethernet interface. However, it is not working as designed, and complaints from your users have not given much insight into the source of the problems. You must first define what is not working as expected, and then analyze the existing configurations to determine and correct the source of the problems.

This lab is complete when you can demonstrate IP connectivity between each of the user VLANs and the external server network, and between the switch management VLAN and the server network.

Lab XIII: Basic Wireless Configuration

Topology Diagram

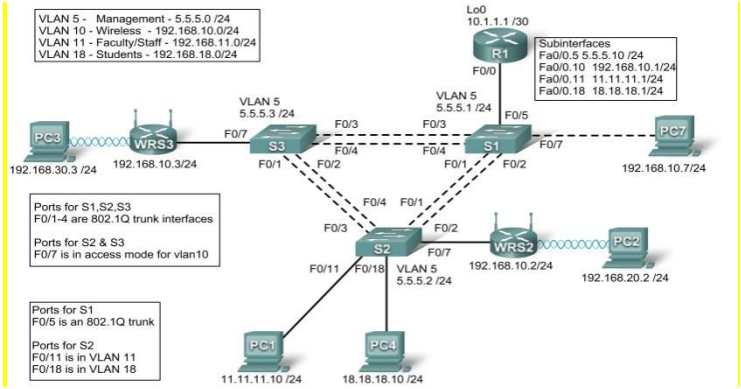


Learning Objectives

- Configure options in the Linksys Setup tab.
- Configure options in the Linksys Wireless tab.
- Configure options in the Linksys Administration tab.
- Configure options in the Linksys Security tab.
- Add wireless connectivity to a PC.
- Test connectivity.

Lab XIV: Troubleshooting Wireless Configuration

Topology Diagram



Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	Fa0/0.5	5.5.5.10	255.255.255.0	N/A
	Fa0/0.10	192.168.10.1	255.255.255.0	N/A
	Fa0/0.11	11.11.11.1	255.255.255.0	N/A
	Fa0/0.18	18.18.18.1	255.255.255.0	N/A
	Lo0	10.1.1.1	255.255.255.252	N/A
WRS2	WAN	192.168.10.2	255.255.255.0	192.168.10.1
	LAN/Wireless	192.168.20.1	255.255.255.0	N/A
WRS3	WAN	192.168.10.3	255.255.255.0	192.168.10.1
	LAN/Wireless	192.168.30.1	255.255.255.0	N/A
PC1	NIC	11.11.11.10	255.255.255.0	11.11.11.1
PC4	NIC	18.18.18.10	255.255.255.0	18.18.18.1
S1	VLAN 5	5.5.5.1	255.255.255.0	N/A
S2	VLAN 5	5.5.5.2	255.255.255.0	N/A
S3	VLAN 5	5.5.5.3	255.255.255.0	N/A

Scenario

In this lab, a basic network and wireless network have been configured improperly. You must find and correct the misconfigurations based on the minimum network specifications provided by your company.

Here are the configurations to load into your router and switches.

R1 Configuration

```
hostname R1
!
interface Loopback0
 ip address 10.1.1.1 255.255.255.0
!
interface FastEthernet0/0
 no ip address
 duplex auto
 speed auto
 no shutdown
!
```

```
interface FastEthernet0/0.5
 encapsulation dot1Q 5
 ip address 5.5.5.10 255.255.255.0
!
interface FastEthernet0/0.10
 encapsulation dot1Q 10
 ip address 192.168.11.1 255.255.255.0
!
!
interface FastEthernet0/0.18
 encapsulation dot1Q 18
 ip address 18.18.18.1 255.255.255.0
!
ip route 192.168.20.0 255.255.255.0 192.168.10.2
ip route 192.168.30.0 255.255.255.0 192.168.10.3
!
line con 0
 exec-timeout 0 0
 logging synchronous
!
end
```

Switch 1 Configuration

```
hostname S1
!
vtp mode transparent
!
vlan 5,10-11
!
interface FastEthernet0/1
 switchport trunk allowed vlan 5,10,11
 switchport mode trunk
 switchport trunk native vlan 5
!
interface FastEthernet0/2
 switchport trunk allowed vlan 5,10,11
 switchport mode trunk
 switchport trunk native vlan 5
!
interface FastEthernet0/3
 switchport trunk allowed vlan 5,10,11
 switchport mode trunk
 switchport trunk native vlan 5
!
interface FastEthernet0/4
 switchport trunk allowed vlan 5,10,11
 switchport mode trunk
 switchport trunk native vlan 5
```

```
!
interface FastEthernet0/5
 switchport mode trunk
 switchport trunk native vlan 5
!
interface Vlan5
 ip address 5.5.5.1 255.255.255.0
 no shutdown
!
line con 0
 exec-timeout 0 0
 logging synchronous
!
End
```

Switch 2 Configuration

```
hostname S2
!
vtp mode transparent
ip subnet-zero
!
vlan 5,10-11,18
!
interface FastEthernet0/1
 switchport trunk allowed vlan 5,10,11,18
 switchport mode access
!
interface FastEthernet0/2
 switchport trunk allowed vlan 5,10,11,18
 switchport mode access
!
interface FastEthernet0/3
 switchport trunk allowed vlan 5,10,11,18
 switchport mode access
!
interface FastEthernet0/4
 switchport trunk allowed vlan 5,10,11,18
 switchport mode access
!
interface FastEthernet0/7
 switchport access vlan 10
!
interface FastEthernet0/11
 switchport access vlan 11
 switchport mode access
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky 0336.5b1e.33fa
!
```

```
interface FastEthernet0/18
 switchport access vlan 18
 switchport mode access
 switchport port-security
 switchport port-security mac-address sticky
 switchport port-security mac-address sticky 022c.ab13.22fb
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan5
 ip address 5.5.5.2 255.255.255.0
 no shutdown
!
line con 0
 exec-timeout 0 0
 logging synchronous
!
End
```

Switch 3 Configuration

```
hostname S3
!
vtp mode transparent
!
vlan 5,10-11,18
!
interface FastEthernet0/1
 switchport trunk allowed vlan 5,10,11,18
 switchport mode trunk
 switchport trunk native vlan 5
!
interface FastEthernet0/2
 switchport trunk allowed vlan 5,10,11,18
 switchport mode trunk
 switchport trunk native vlan 5
!
interface FastEthernet0/3
 switchport trunk allowed vlan 5,10,11,18
 switchport mode trunk
 switchport trunk native vlan 5
!
interface FastEthernet0/4
 switchport trunk allowed vlan 5,10,11,18
 switchport mode trunk
 switchport trunk native vlan 5
!
```

```
interface FastEthernet0/7
!
interface Vlan1
 no ip address
 no ip route-cache
!
interface Vlan5
 ip address 6.6.6.3 255.255.255.0
no shutdown
!
line con 0
 exec-timeout 0 0
 logging synchronous
!
end
```

Wireless Router Network Requirements

While troubleshooting WRS2 and WRS3, ensure that at least the following capabilities exist:

1. Connections via the IP addresses shown in the topology diagram.
2. More than 30 clients can get an IP address through DHCP at a single time.
3. A client can have a DHCP address for at least 2 hours.
4. Clients using both B and G wireless network modes can connect, but N clients cannot.
5. Wireless clients must be authenticated using WEP with a key of 5655545251.
6. Traffic between PC2 and PC3 must take the most efficient route possible.
7. Ping requests coming from outside WAN ports of the Linksys routers to their inside LAN/wireless IP addresses (192.168.30.1) must be successful.
8. DHCP must not give out IP addresses in a range that includes the addresses for PC2 and PC3.
9. The two wireless networks must not interfere with each other.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

MINOR PROJECT

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS250	-	-	-	6	2

Course Learning Outcome

CO1. Identify the proposed problem

CO2. Develop a functional application based on the software design

CO3. Apply to code, debugging, and testing tools for implementation

CO4. Prepare the proper documentation for report writing and oral presentation.

GUIDELINES FOR PROJECT FILE

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation.

Research is genuine exploration of the unknown that leads to new knowledge, which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals.
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

Report Layout

The report should contain the following components

1. File should be in the following specification

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components

Front Page
Table of Contents
Acknowledgement
Student Certificate
Company Profile
Introduction
Chapters
Appendices
References / Bibliography

- **Title or Cover Page or Front Page**

The title page should contain the following information: Project Title; Student's Name; Course; Year; Supervisor's Name.

- **Table of Contents**

Titles and subtitles are to correspond exactly with those in the text.

- **Acknowledgement**

Acknowledgment to any advisory or financial assistance received in the course of work may be given.

- **Student Certificate**

Given by the Institute.

- **Company Certificate & Profile**

This is a certificate, which the company gives to the students. A Company Profile corresponds to a file with company-specific data. Company data can be stored there and included in a booking when needed.

- **Introduction**

Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

- **Chapters**

All chapters and sections must be appropriately numbered, titled and should neither be too long nor too short in length.

The first chapter should be introductory in nature and should outline the background of the

project, the problem being solved, the importance, other related works and literature survey.

The other chapters would form the body of the report. The last chapter should be concluding

in nature and should also discuss the future prospect of the project.

- **Appendices**

The Appendix contains material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

- **References / Bibliography**

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project. Project execution is concerned with assessing how much work has been put in.
The File should fulfill the following ***assessment objectives:***

1. Writing a critical literature review
    - Search for literature
    - Summarizing and presenting the literature
    - Evaluating key content and theories

2. Collecting and analyzing research material
    - Choosing and designing research method
    - Conducting the research
    - Analyzing, sorting and classifying the data to make decision

3. Interpreting research method and draw conclusion
    - Findings
    - Recommendation

4. Assigning the theories and writing the project report
    - Structuring the project in accordance with the given style

5. Bibliography
    - This refer to the books, Journals and other documents consulting while working on the project

Examination Scheme:

Components	**MRP**	**V**	**S**	**FP**	**R**
Weightage (%)	20	20	20	20	20

MRP – Mid Report Presentation, V – Viva, S – Synopsis, FP – Final Presentation, R - Report

Course Title: Anandam

Type: Compulsory

Semester II

Course Code: AND002 **Credit Units: 02**

Course Learning Outcomes:

The student should develop:

- Awareness and empathy regarding community issues
- Interaction with the community and impact on society
- Interaction with mentor and development of Student teacher relationship
- Interaction among students, enlarge social network
- Cooperative and Communication skills and leadership qualities
- Critical thinking, Confidence and Efficiency

Course Objectives:

After the completion of this course, students will be able to:

- apply their knowledge and skills to solve specific community problem
- learn to plan, lead, and organize community events have a sense of belonging to their college campus and community and find something they are interested in doing during their free time
- make new friends, expand social network, and boost social skills and mental health.
- be useful to society as it will protect them against stress, frustration, and depression

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants, phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.

- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.
3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
6. For the topic chosen by the group, students are recommended to cover the following points:
    a) Current scenario (Regional, national and international level as applicable)
    b) Future predictions
    c) Duty of the government
    d) Government policies (related to the topic), if any
    e) Duty of public
    f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
3. Conclusion is clearly stated. The underlying logic is explicit.

COMMUNICATION SKILLS-II

CODE	L	T	P/FW	CREDITS	SEMESTER
BCS 211	1	-	-	1	2

Course Learning Outcome

1. Identify essentials components of language
2. Make inferences and predictions about spoken discourse
3. Develop Creative & Literary Sensitivity in global situation
4. Identify features of a reading textbook and utilize them as needed

Course Objective:

To enrich the understanding of English language and communication, structure, style, usage, and vocabulary for global business purposes.

Course Contents:

Module I: Fundamentals of Communication

Role and purpose of communication: *7 C's of communication*
Barriers to effective communication
Enhancing listening
Forms of Communication: one-to-one, informal and formal

Module II: Verbal Communication (Written)

Business Letter
Social correspondence
Writing resume and Job applications

Module III: Speaking skills

Conversational English
Guidelines to give an effective presentation
Activities to include:
Presentations by students
Just a minute
Dream company-based presentation/ PPT Presentation

Interview Essentials (Mock PI) + CV-2

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A

Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Business Communication, Raman – Prakash, Oxford
- Textbook of Business Communication, Ramaswami S, Macmillan
- Speaking Personally, Porter-Ladousse, Cambridge

BEHAVIOURAL SCIENCE-II

(Behavioural Communication and Relationship Management)

1	L	T	P/FW	CREDITS	SEMESTER
BSS 211	1	-	-	1	2

Course Learning Outcome

1. Recognize the relation critical thinking with various mental processes.
2. Identify hinderance to problem solving processes.
3. Analyse the steps in problem-solving process.
4. Create plan of action applying creative thinking.

Course Objective:

This course aims at imparting an understanding of:
Process of Behavioural communication
Aspects of interpersonal communication and relationship
Management of individual differences as important dimension of IPR

Course Contents:

Module I: Behavioural Communication
Scope of Behavioural Communication
Process – Personal, Impersonal and Interpersonal Communication
Guidelines for developing Human Communication skills
Relevance of Behavioural Communication in relationship management

Module II: Managing Individual Differences in Relationships
Principles
Types of issues
Approaches
Understanding and importance of self disclosure
Guidelines for effective communication during conflicts

Module III: Communication Climate: Foundation of Interpersonal Relationships
Elements of satisfying relationships
Conforming and Disconforming Communication
Culturally Relevant Communication
Guideline for Creating and Sustaining Healthy Climate

Module IV: Interpersonal Communication
Imperatives for Interpersonal Communication
Models – Linear, Interaction and Transaction
Patterns – Complementary, Symmetrical and Parallel
Types – Self and Other Oriented
Steps to improve Interpersonal Communication

Module V: Interpersonal Relationship Development
Relationship circle – Peer/ Colleague, Superior and Subordinate
Initiating and establishing IPR
Escalating, maintaining and terminating IPR
Direct and indirect strategies of terminating relationship
Model of ending relationship

Module VI: End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Examination Scheme:

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
Weightage (%)	20	05	20	30	25

Text & References:

- Vangelist L. Anita, Mark N. Knapp, Inter Personal Communication and Human Relationships: Third Edition, Allyn and Bacon
- Julia T. Wood. Interpersonal Communication everyday encounter
- Simons, Christine,Naylor,Belinda: Effective Communication for Managers,1997 1st Edition Cassell
- Harvard Business School, Effective Communication: United States of America
- Beebe, Beebe and Redmond; Interpersonal Communication, 1996; Allyn and Bacon Publishers.

FRENCH

CODE	L	T	P/FW	CREDITS	SEMESTER
FLT 211	2	-	-	2	2

Course Learning Outcome

1. understand and give instructions
2. understand and reply to a letter
3. speak about learning languages
4. find a particular information in a text
5. understand a conversation

Course Objective:

- To enable the students to overcome the fear of speaking a foreign language and take position as a foreigner speaking French.
- To make them learn the basic rules of French Grammar.

Course Contents:

Module A: pp.38 – 47: Unité 3: Objectif 3, 4, 5. 6

Module B: pp. 47 to 75 Unité 4, 5

Contenu lexical: **Unité 3: Organiser son temps**

1. donner/demander des informations sur un emploi du temps, un horaire SNCF – Imaginer un dialogue
2. rédiger un message/ une lettre pour …

i) prendre un rendez-vous/ accepter et confirmer/ annuler

ii) inviter/accepter/refuser

3. Faire un programme d'activités

imaginer une conversation téléphonique/un dialogue

Propositions- interroger, répondre

Unité 4: **Découvrir son environnement**

1. situer un lieu
2. s'orienter, s'informer sur un itinéraire.
3. Chercher, décrire un logement
4. connaître les rythmes de la vie

Unité 5: s'informer

1. demander/donner des informations sur un emploi du temps passé.
2. donner une explication, exprimer le doute ou la certitude.
3. découvrir les relations entre les mots
4. savoir s'informer

Contenu grammatical:

1. Adjectifs démonstratifs
2. Adjectifs possessifs/exprimer la possession à l'aide de: i. « de » ii. A+nom/pronom disjoint
3. Conjugaison pronominale – négative, interrogative - construction à l'infinitif
4. Impératif/exprimer l'obligation/l'interdiction à l'aide de « il faut…. »/ «il ne faut pas… »
5. passé composé
6. Questions directes/indirectes

Examination Scheme:

Components	**CT1**	**CT2**	**C**	**I**	**V**	**A**
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- **le livre à suivre: Campus: Tome 1**

GERMAN

CODE	L	T	P/FW	CREDITS	SEMESTER
FLG 211	2	-	-	2	2

Course Learning Outcome

1. understand and give instructions
2. understand and reply to a letter
3. speak about learning languages
4. find a particular information in a text
5. understand a conversation

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany
Introduction to Grammar to consolidate the language base learnt in Semester I

Course Contents:

Module I: Everything about Time and Time periods
Time and times of the day.
Weekdays, months, seasons.
Adverbs of time and time related prepositions

Module II: Irregular verbs
Introduction to irregular verbs like to be, and others, to learn the conjugations of the same, (fahren, essen, lessen, schlafen, sprechen und ähnliche).

Module III: Separable verbs
To comprehend the change in meaning that the verbs undergo when used as such
Treatment of such verbs with separable prefixes

Module IV: Reading and comprehension
Reading and deciphering railway schedules/school time table
Usage of separable verbs in the above context

Module V: Accusative case
Accusative case with the relevant articles
Introduction to 2 different kinds of sentences – Nominative and Accusative

Module VI: Accusative personal pronouns
Nominative and accusative in comparison
Emphasizing on the universal applicability of the pronouns to both persons and objects

Module VII: Accusative prepositions
Accusative propositions with their use
Both theoretical and figurative use

Module VIII: Dialogues
Dialogue reading: 'In the market place'
'At the Hotel'

Examination Scheme:

Components	CT1	CT2	C	I	V	A

Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH

CODE	L	T	P/FW	CREDITS	SEMESTER
FLS 211	2	-	-	2	2

Course Learning Outcome

1. understand and give instructions
2. understand and reply to a letter
3. speak about learning languages
4. find a particular information in a text
5. understand a conversation

Course Objective:

To enable students acquire more vocabulary, grammar, verbal phrases to understand simple texts and start describing any person or object in Simple Present Tense.

Course Contents:

Module I

Revision of earlier modules.

Module II

Some more AR/ER/IR verbs. Introduction to root changing and irregular AR/ER/IR ending verbs

Module III

More verbal phrases (eg, Dios Mio, Que lastima etc), adverbs *(bueno/malo, muy, mucho, bastante, poco).*

Simple texts based on grammar and vocabulary done in earlier modules.

Module IV

Possessive pronouns

Module V

Writing/speaking essays like my friend, my house, my school/institution, myself….descriptions of people, objects etc, computer/internet related vocabulary

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras

CHINESE

CODE	L	T	P/FW	CREDITS	SEMESTER
FLC 211	2	-	-	2	2

Course Learning Outcome

1. understand and give instructions
2. understand and reply to a letter
3. speak about learning languages
4. find a particular information in a text
5. understand a conversation

Course Objective:

Chinese is a tonal language where each syllable in isolation has its definite tone (flat, falling, rising and rising/falling), and same syllables with different tones mean different things. When you say, "ma" with a third tone, it mean horse and "ma" with the first tone is Mother. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I

Drills
Practice reading aloud
Observe Picture and answer the question.
Tone practice.
Practice using the language both by speaking and by taking notes.
Introduction of basic sentence patterns.
Measure words.
Glad to meet you.

Module II

Where do you live?
Learning different colors.
Tones of "bu"
Buying things and how muchit costs?
Dialogue on change of Money.
More sentence patterns on Days and Weekdays.
How to tell time. Saying the units of time in Chinese. Learning to say useful phrases like – 8:00, 11:25, 10:30 P.M. everyday, afternoon, evening, night, morning 3:58, one hour, to begin, to end ….. etc.
Morning, Afternoon, Evening, Night.

Module III

Use of words of location like-li, wais hang, xia
Furniture – table, chair, bed, bookshelf,.. etc.
Description of room, house or hostel room.. eg what is placed where and how many things are there in it?
Review Lessons – Preview Lessons.
Expression 'yao", "xiang" and "yaoshi" (if).
Days of week, months in a year etc.
I am learning Chinese. Is Chinese difficult?

Module IV
Counting from 1-1000
Use of "chang-chang".
Making an Inquiry – What time is it now? Where is the Post Office?
Days of the week. Months in a year.
Use of Preposition – "zai", "gen".
Use of interrogative pronoun – "duoshao" and "ji".
"Whose"??? Sweater etc is it?
Different Games and going out for exercise in the morning.

Module V
The verb "qu"
Going to the library issuing a book from the library
Going to the cinema hall, buying tickets
Going to the post office, buying stamps
Going to the market to buy things.. etc
Going to the buy clothes …. Etc.
Hobby. I also like swimming.
Comprehension and answer questions based on it.

Examination Scheme:

Components	**CT1**	**CT2**	**C**	**I**	**V**	**A**
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- "Elementary Chinese Reader Part I" Lesson 11

DATABASE AND APPLICATION SECURITY

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS301	2	1	-	3	3

Course Learning Outcome

CLO 1: Design and implement access control rules to assign privileges and to secure data stored in databases.

CLO 2:Conduct database auditing for security and reliability.

CLO 3: Determine and analyse software vulnerabilities and security solutions to reduce the risk of exploitation.

CLO 4: Design a web – application Vulnerability and Security Assessment Test Plan

Module- I:

Database security – Introduction includes threats, vulnerabilities and breaches,Basics of database design,DB security – concepts, approaches and challenges, types of access controls, Oracle VPD,Discretionary and Mandatory access control – Principles, applications and polyinstantiation

Module- II:

Database inference problem, types of inference attacks, distributed database, security levels, SQL-injection: types and advanced concepts.Security in relational data model, concurrency controls and locking,SQL extensions to security (oracle as an example), System R concepts, Context and control based access control, Hippocraticdatabases, Databasewatermarking, Databaseintrusion, Secure data outsourcing

Module- III:

Web application security,Basic principles and concepts,Authentication,Authorization, Browser security principles; XSS and CSRF, same origin policies,File security principles,Secure development and deployment methodologies,Web DB principles, OWASP – Top 10 - Detailed treatment,IoT security – OWASP Top 10 – Detailed treatment,Mobile device security – Introduction, attack vector and models, hardware centric security aspects, SMS / MMS vulnerabilities, software centric security aspects

Module- IV:

Mobile web browser security,Application security – Concepts, CIA Triad, Hexad, types of cyber attacks,Introduction to software development vulnerabilities, code analyzers – Static and dynamic analyzers,Security testing / Penetration testing – Principles and concepts, PT work flows and examples, blind tests, ethical hacking techniques, synthetic transactions, interface testing and fuzzing,SDLC phases and security mandates

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

TEXTBOOKS/ REFERENCES:

1.Michael Gertz and SushilJajodia, “Handbook of Database Security— Applications and Trends”, Springer, 2008.

2. Bryan and Vincent, “Web Application Security, A Beginners Guide ”,McGraw-Hill, 2011
3. BhavaniThuraisingham, “Database and Applications Security”, Integrating Information Security and Data Management, Auerbach Publications, 2005.
4. Alfred Basta, Melissa Zgola, “Database Security”, Course Technology, 2012

SECURE SOFTWARE ENGINEERING

CODE	L	T	P/FW	CREDITS	SEMESTER
MCS 302	2	1	-	3	3

Course Learning Outcome

CLO1: Understand of how a secure software engineering is enhance the security of application, how SSDLC is different from SDLC and to understand the various techniques and strategies to detect the software security, managing secure software development.

CLO 2:Articulate the importance of different properties of secure software, how to assert and specify security properties.

CLO 3: Comprehend the various secure software architecture and design, risk analysis, threat and risk associated with it, available to provide proactive and reactive approach to the security in a system and recognize various principal, security guideline and attack patterns.

CLO 4: Understand the basic terminologies associated with cryptography, technique for secure coding, validation rules, software security testing as well as code review process

Course Contents:

Module I: Introduction to Data Structures

Software assurance and software security, threats to software security, sources of softwareinsecurity, benefits of detecting software security, managing secure software development.

Module II: Searching and Sorting Techniques

Defining properties of secure software, how to influence the security properties of software,how to assert and specify desired security properties

Module III: Stacks

Secure software Architecture and Design: Software security practices for architecture anddesign: Architectural risk analysis, software security knowledge for Architecture and Design:security principles, security guidelines, and attack pattens, secure design through threatmodeling.

Module IV: Queues

Writing secure software code: Secure coding techniques, Secure Programming: Datavalidation, Secure Programming: Using Cryptography Securely, Creating a Software SecurityPrograms.

Module V: Programming with Linked Lists

Secure Coding and Testing: code analysis- source code review, coding practices, staticanalysis, software security testing, security testing consideration through SDLC

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Ross J Anderson, Security Engineering: A Guide to Building Dependable DistributedSystems, 2nd Edition, Wiley, 2008.
- Julia H Allen, Sean J Barnum, Robert J Ellison, Gary McGraw, Nancy R Mead, SoftwareSecurity Engineering: A Guide for Project Managers, Addison Wesley, 2008

References:

Howard, M. and LeBlanc, D., Writing Secure Code, 2nd Edition, Microsoft Press, 2003

ETHICAL HACKING AND DIGITAL FORENSIC TOOLS

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS303	2	1	0	3	3

Course Learning Outcome

CLO1:Understand of how a hacking is different from ethical hacking and to understand the various techniques and strategies to perform the window hacking to find the vulnerabilities of the system.

CLO 2:Articulate the importance of different internet protocols and checksum and importance of port scanning, DNS spoofing, and Firewall.

CLO 3: Comprehend the various computer frauds, different threat and risk associated with it, available to provide proactive and reactive approach to the security in a system and recognize various threats, frauds and how they happen to help design some form of counter measures to safeguard the security of the system.

CLO 4: Understand the basic terminologies associated computer forensic with practical implementation in data recovery, creating image file, data finding concept and to understand the various techniques and strategies related to journal risk and control matrix.

Module- I:

Hacking windows – Network hacking – Web hacking – Password hacking. A study on various attacks – Input validation attacks – SQL injection attacks – Buffer overflow attacks - Privacy attacks.

Module- II:

TCP / IP – Checksums – IP Spoofing port scanning, DNS Spoofing. Dos attacks – SYN attacks, Smurf attacks, UDP flooding, DDOS – Models. Firewalls – Packet filter firewalls, Packet Inspection firewalls – Application Proxy Firewalls. Batch File Programming.

Module- III:

Fundamentals of Computer Fraud – Threat concepts – Framework for predicting inside attacks – Managing the threat – Strategic Planning Process. Architecture strategies for computer fraud prevention – Protection of Web sites – Intrusion detection system – NIDS, HIDS – Penetrating testing process – Web Services – Reducing transaction risks.

Module- IV:

Key Fraud Indicator selection process customized taxonomies – Key fraud signature selection process –Accounting Forensics – Computer Forensics – Journaling and it requirements – Standardized logging criteria – Journal risk and control matrix – Neural networks – Misuse detection and Novelty detection.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

References:

1. Kenneth C.Brancik “Insider Computer Fraud” Auerbach Publications Taylor & Francis Group, 2008. 2. 2. AnkitFadia“ Ethical Hacking” 2nd Edition Macmillan India Ltd, 2006

ETHICAL HACKING AND DIGITAL FORENSIC TOOLS LAB

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS323	-	-	2	1	3

Course Learning Outcome

CLO1:Understand of how a hacking is different from ethical hacking and to understand the various techniques and strategies to perform the window hacking to find the vulnerabilities of the system as well as OWASP top 10 vulnerability.

CLO 2:Articulate the importance of different internet protocols and checksum and perform different scanning techniques like port scanning, DNS spoofing, to gather the data, implement the Firewall inbound and outbound rules.

CLO 3: Apply his/her knowledge in the area to make the secure system as well as protect the network by providing the different security solution or patches.

CLO 4: Understand terminologies associated computer forensic with practical implementation in data recovery, creating image file, data finding concept to find the evidence or proof related to digital crime.

List of Experiments

1. Working with OWASP top 10 vulnerability.
2. Types of vulnerability and detection method.
3. VM, VP, PT tools manual and automation.
4. Creationof .bat files and insertion.
5. Introduction of automation tools i.e. qualys, ibm appscan, hp web inspect and acunetix.
6. Introduction of manual tools i.e. fiddler, burp suite.
7. Vulnerability analysis on sast and dast.
8. Infrastructure and web application vulnerability.
9. Honeypots, passworx guessing and cracking.
10. Exposure of ISO 27001 and hippa for finding vul on phi/pii data.

Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	15	15	15	25	25

ARTIFICIAL INTELLIGENCE AND NEURAL NETWORK

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS331	2	1	-	3	3

Course Learning Outcome

CLO1: Able to understand the AI principals and its applications in our world

CLO 2: To understand how search can be performed using search methods based on AI and how they can be implemented for real world problems

CLO 3: To understand Predicate logic that has been used to increase precision in describing and studying structures from linguistics and philosophy to mathematics and computer science.

CLO 4: To be able to understand Fuzzy logic and how it can be use in real world applications to benefit us.

Course Contents:

Module I: Introduction

AI and its importance, AI Problem, Application area.

Module II: Problem Representations

State space representation, problem-reduction representation, production system, production system characteristics, and types of production system.

Module III: Heuristic Search Techniques

AI and search process, brute force search, depth-first search, breadth-first search, time and space complexities, heuristics search, hill climbing, best first search, A*, AO* algorithm, constraint satisfaction, and beam search.

Module IV: Knowledge Representation issues using predicate logic

Representation and mapping, knowledge representation mechanism, inheritable knowledge, Prepositional logic: syntax and semantics, First Order Predicate Logic (FOPL).

Module V: Expert System

Basic understanding of Fuzzy Logic, Artificial Neural Network, Perceptron, Natural Language Processing, Pattern Recognition, Robotics, LISP and Prolog.The role of Artificial intelligence in Biotechnology.Introduction to Bio-inspired computing.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Artificial Intelligence – II Edition, Elaine Rich, Kevin Knight TMH.

References:

- Foundations of Artificial Intelligence and Expert Systems, V S Janakiraman, K Sarukesi, P Gopalakrishan, Macmillan India Ltd.
- Introduction to AI and Expert System, Dan W. Patterson, PHI.

HUMAN COMPUTER INTERACTION

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS332	2	1	-	3	3

Course Learning Outcome

1. To study how can people interact with computers and to what extent computers are or are not developed for successful interaction with human beings.
2. To produce usable and safe systems, as well as functional systems.
3. To provides the concepts of HCI and user interfaces, focusing on user interface design, evaluation, and technologies.

Course Contents:

Module: I: Introduction

Importance of user Interface-definition, importance of 8good design. Benefits of good design. A brief history of Screen design.The graphical user interface-popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user-Interface popularity, characteristics-Principles of user interface

Module II: Design process

Human interaction with computers, importance of 8 human characteristics human consideration, Human interaction speeds, understanding business junctions

Module III: Screen Designing

Design goals-Screen planning and purpose, 8 organizing screen elements, ordering of screen data and content-screen navigation and flow-Visually pleasing composition-amount of information-focus and emphasis-presentation information simply and meaningfully-information retrieval on web-statistical graphics-
Technological consideration in interface design

ModuleIV:Windows

New and Navigation schemes selection of window, 8 selection of devices based and screen based controls. Components-text and messages, Icons and increases-Multimedia, colors, uses problems, choosing colors.

Module V:Software tools

Specification methods, interface-Building Tools. 8 Interaction Devices-Keyboard and function keys-pointing devices-speech recognition digitization and generation-image and video displays-drivers.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

1. Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale Human ComputerInteraction, 3rd Edition Prentice Hall, 2004.
2. Jonathan Lazar Jinjuan Heidi Feng, Harry Hochheiser, Research Methods inHumanComputer Interaction, Wiley, 2010.

References:

1. Ben Shneiderman and Catherine Plaisant Designing the User Interface: Strategies for Effective Human-Computer Interaction (5th Edition, pp. 672, ISBN 0-321-53735-1, March 2009), Reading, MA: Addison-Wesley Publishing Co.

DESIGN AND ANALYSIS OF ALGORITHM

COURSE CODE	L	T	P/FW	CREDIT UNITS	SEMESTER
MCS333	2	1	-	3	3

Course Learning Outcome

1. To provide the fundamentals concepts of Design & analysis of Algorithms.
2. To provides knowledge of Time and space complexity of algorithms.
3. To provide Mathematical foundations, Sorting & searching Order Statistics, Data Structures, Advanced Design & Analysis techniques such as Divide & Conquer, greedy method, graph theory & Dynamic Programming approaches.

Course Contents:

Module I: Algorithm Analysis

Introduction Algorithms Complexity measures, Best, worst and average-case complexity functions,problem complexity, quick review of basic data structures and algorithm design principles.

Module II: Sorting and searching Order statistics

Sorting by selection, insertion and bubble, Divide & Conquer Strategy, Heap Sort, Quick SortData Sorting in Linear time. other sorting algorithms— radix sort, merge sort, sternsons Matrix Multiplication.

Searching in static table— binary search, path lengths in binary trees and applications, optimality of binary search in worst cast and average-case Binary search trees, construction of optimal weighted binary search trees; Searching in dynamic table -randomly grown binary search trees, AVL and (a, b) trees. Hashing: Basic ingredients, analysis of hashing with chaining and with open addressing.

Module III: Advanced Design and Analysis Techniques

Dynamic programming- Elements of dynamic programming, Chain-matrix multiplication, All pair shortest path (Flayed -algorithm), Optimal Binary Search Tree.

Greedy algorlthms- Elements of the greedy strategy, Huffman codes, Single-source shortest path in a directed graph, Knapsack problem.

Module IV: Graph Algorithms

Elementary graphs Algorithms, Minimum spanning Trees minimum spanning trees— Kruskal's and Prim's algorithms— Johnson's implementation of Prim's algorithm using priority queue data structures, Single source Shortest paths, All Pair Shortest Paths. *String processing*: String searching and Pattern matching, Knuth-Morris-Pratt algorithm and its analysis.

Module V : NP-completeness

Informal concepts of deterministic and nondeterministic algorithms, P and NP,NP-completeness, statement of Cook's theorem, some standard NP-complete problems, approximation algorithms.

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text Books:

- T. H. Cormen, C. E. Leiserson and R. L. Rivest: Introduction to Algorithms, Prentice Hall of India, New Delhi, 1998.
- E. Horowitz and S. Sahani: Fundamental of Computer Algorithms, Galgotia Pub. /Pitman, New Delhi/London, 1987/1978.

References Books:

- A. Aho, J. Hopcroft and J. Ullman; The Design and Analysis of Computer Algorithms, A. W. L, International Student Edition, Singapore, 1998
- S. Baase: Computer Algorithms: Introduction to Design and Analysis, 2nd ed., Addison- Wesley, California, 1988.
- K. Mehlhom: Data Structures and Algorithms, Vol. 1 and Vol. 2, Springer-Verlag, Berlin, 1984.
- A. Borodin and I. Munro: The Computational Complexity of Algebraic and Numeric Problems, American Elsevier, New York, 1975.
- D. E. Knuth: The Art of Computer Programming, Vol. 1, Vol. 2 and Vol. 3. Vol. 1, 2nd ed., Narosa/Addison-Wesley, New Delhi/London, 1973; Vol. 2: 2nd ed., Addison-Wesley, 18 London, 1981; Vol. 3: Addison-Wesley, London, 1973.
- S. Winograd: The Arithmetic Complexity of Computation, SIAM, New York, 1980.

PRINCIPLES OF VIRTUALIZATION

Course Code	L	T	P	Credit	SEMESTER
MCS334	2	1	-	3	3

Course Learning Outcome

1. To reduce IT expenses while boosting efficiency and agility in organizations.
2. To explores the implementation and usage of VMWare Virtualization,
3. To explores the process and the working of Windows Server hyper V.

Course Contents:

Module I: Basics of Virtualization

Introduction to Unit, Need of Virtualization and Virtualization Technologies: Server Virtualization, Storage Virtualization, I/O Virtualization, Network Virtualization, Client Virtualization, Application virtualization, Desktop virtualization , Understanding Virtualization Uses: Studying Server Consolidation, Development and Test Environments , Helping with Disaster Recovery , Conclusion of the Unit

Module II: Deploying and Managing an Enterprise Desktop Virtualization Environment

Introduction to Unit , configure the BIOS to support hardware virtualization; - Install and configure Windows Virtual PC: installing Windows Virtual PC on various platforms (32-bit, 64-bit) - Creating and managing virtual hard disks - Configuring virtual machine resources including network resources - Preparing host machines; create, deploy, and maintain images

Module III: Deploying and Managing a Presentation Virtualization Environment I

Introduction to Unit , Prepare and manage remote applications - Configuring application sharing ; Package applications for deployment by using RemoteApp, installing and configuring the RD Session Host Role Service on the server. - Conclusion of the Unit

Module IV: Deploying and Managing a Presentation Virtualization Environment II

Access published applications: configuring Remote Desktop Web Access, configuring role-based application provisioning, configuring Remote Desktop client connections. - Configure client settings to access virtualized desktops: configuring client settings - Conclusion of the Unit

Module V: Understanding Virtualization Software

List of virtualization Software available . Vmware- introduction to Vsphere, ESXi, VCenter Server and Vsphere client. - Creating Virtual Machine.. Introduction to HYPER-V role. Create Virtual Machines. Create Hyper-v virtual networking, Use virtual Machine Snapshots. - Monitor the performance of a Hyper-v server, Citrix XENDesktop fundamentals

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Virtualization with Microsoft Virtual Server 2005, Twan Grotenhuis, Rogier Dittner, Aaron Tiensivu, Ken Majors, Geoffrey Green, David Rule, Andy Jones, Matthijs ten Seldam; Syngress Publications, 2006

- Virtualization--the complete cornerstone guide to virtualization best practices, Ivanka Menken, Gerard Blokdijk, Lightning Source Incorporated, 2008

PYTHON

Course Code	L	T	P/FW	CREDITS	SEMESTER
MCS335	2	1	-	3	3

Course Learning Outcome

CLO 1 Recognize the python programming problem solution and its implementation

CLO 2 Identify the tools for python programming.

CLO 3 Describe the concept of different library functions and its utilization.

CLO 4 Apply knowledge of python programming techniques to solve computer problems.

Course Contents:

Module-I

Introduction to Python- features and basic syntax, interactive shell, editing, saving, and running a script. The concept of data types; variables, assignments; immutable variables; numerical types; arithmetic operators and expressions; understanding error messages; Conditions, boolean logic, logical operators; ranges; Control statements: if-else, loops (for, while); short-circuit (lazy) evaluation

Module-II

Strings and text files; manipulating files and directories; text files: reading/writing text and numbers from/to a file; creating and reading a formatted file.
String manipulations: subscript operator, indexing, slicing a string; strings and number system: converting strings to numbers and vice versa. Binary, octal, hexadecimal numbers

Module-III

Lists, tuples, and dictionaries; basic list operators, replacing, inserting, removing an element; searching and sorting lists; dictionary literals, adding and removing keys, accessing and replacing values; traversing dictionaries. Design with functions: hiding redundancy, complexity; arguments and return values; formal vs actual arguments, named arguments. Recursive functions.

Module-IV

Simple graphics and image processing: “turtle” module; simple 2d drawing - colors, shapes; digital images, image file formats, image processing; Simple image manipulations with 'image' module - convert to bw, greyscale, blur, etc.

Module-V

Classes and OOP: classes, objects, attributes and methods; defining classes; design with classes, data modeling; persistent storage of objects; inheritance, polymorphism, operator overloading; abstract classes; exception handling, try block

Examination Scheme:

Components	C T	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Textbook: *Fundamentals of Python: First Programs* , Author: Kenneth Lambert , Publisher: Course Technology, Cengage Learning, 2012

PRINCIPLES OF VIRTUALIZATION LAB

Course Code	L	T	P	Credit	SEMESTER
MCS344	-	-	2	1	3

Course Learning Outcome

1. Implementation and usage of VMWare Virtualization, its installation process and the working of Windows Server

List of experiments

1. Installing Vmware ESXi server – I

2. Installing Vmware ESXi server - II

3. Installing Vmware ESXi server - III

4. Installing Vmware vCenter with all the prerequisites – I

5. Installing Vmware vCenter with all the prerequisites - II

6. Creating Virtual Machines using vCenter server – I

7. Creating Virtual Machines using vCenter server - II

8. Modifying Virtual Machine settings – I

9. Modifying Virtual Machine settings - II

10. Clone a VM – I

11. Clone a VM - II

12. Clone a VM - III

Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

PYTHON LAB

Course Code	L	T	P/FW	CREDITS	SEMESTER
MCS345	-	-	2	1	3

Course Learning Outcome

1. Read and understand Python-based software code of medium-to-high complexity.

2. Use standard and different type of Python's libraries when required for implementation.

3. Understand the basic principles of creating Python applications or program.

4. Understand the fundamental concepts of computer science: structure of the computational process, algorithms and complexity of computation.

1. Installing Python and configuring environment.
2. To display and find the size of all data types in Python.
3. To show the use of loops
4. To work with different operators including lazy operators.
5. Working with strings operations.
6. Writing and reading to/from a file.
7. To perform operations on list.
8. To perform operations on tuple.
9. To perform operations on dictionary.
10. Working with functions including recursive ones.
11. To perform manipulation with image files.
12. To perform operations on images using turtle module.
13. To show OOP features in Python like encapsulation, inheritance etc.

MINOR PROJECT

Course Code	L	T	P	Credit	SEMESTER
MCS 350	-	-	-	6	3

Course Learning Outcome:

CO1. Identify the proposed problem

CO2. Develop a functional application based on the software design

CO3. Apply to code, debugging, and testing tools for implementation

CO4. Prepare the proper documentation for report writing and oral presentation.

GUIDELINES FOR PROJECT FILE

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation.

Research is genuine exploration of the unknown that leads to new knowledge, which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals.
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

Report Layout

The report should contain the following components

1. File should be in the following specification

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components

Front Page
Table of Contents
Acknowledgement
Student Certificate
Company Profile
Introduction
Chapters
Appendices
References / Bibliography

- **Title or Cover Page or Front Page**

The title page should contain the following information: Project Title; Student's Name; Course; Year; Supervisor's Name.

- **Table of Contents**

Titles and subtitles are to correspond exactly with those in the text.

- **Acknowledgement**

Acknowledgment to any advisory or financial assistance received in the course of work may be given.

- **Student Certificate**

Given by the Institute.

- **Company Certificate & Profile**

This is a certificate, which the company gives to the students. A Company Profile corresponds to a file with company-specific data. Company data can be stored there and included in a booking when needed.

- **Introduction**

Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

- **Chapters**

All chapters and sections must be appropriately numbered, titled and should neither be too long nor too short in length.

The first chapter should be introductory in nature and should outline the background of the project, the problem being solved, the importance, other related works and literature survey.

The other chapters would form the body of the report. The last chapter should be concluding in nature and should also discuss the future prospect of the project.

- **Appendices**

The Appendix contains material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

➢ **References / Bibliography**

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project. Project execution is concerned with assessing how much work has been put in.

The File should fulfill the following ***assessment objectives:***

1. Writing a critical literature review
   - Search for literature
   - Summarizing and presenting the literature
   - Evaluating key content and theories

2. Collecting and analyzing research material
   - Choosing and designing research method
   - Conducting the research
   - Analyzing, sorting and classifying the data to make decision

3. Interpreting research method and draw conclusion
   - Findings
   - Recommendation

4. Assigning the theories and writing the project report
   - Structuring the project in accordance with the given style

5. Bibliography
   - This refer to the books, Journals and other documents consulting while working on the project

Examination Scheme:

Components	**MRP**	**V**	**S**	**FP**	**R**
Weightage (%)	20	20	20	20	20

MRP – Mid Report Presentation, V – Viva, S – Synopsis, FP – Final Presentation, R - Report

REPORT ON PAPER PRESENTATION IN CONFERENCE

Course Code	L	T	P	Credit	SEMESTER
MCS 351	-	-	-	1	3

Course Learning Outcome:

CO1. Ability to be a multi-skilled with sound technical knowledge.
CO2. Ability to communicate efficiently.
CO3. Develop technical report writing and oral presentation skills
CO4. Prepare the proper documentation for report writing and oral presentation.

Objective: Conferences / Seminars / Workshop are good and efficient way to get to know other researchers through their work and also personally.

The educational aspect can expose the students to new ways of conducting the business and help them to discover how to be more productive. They provide a great opportunity to network. Collaboration is the way to approach networking.

Rules and Regulations

- 2nd Year / 3rd Year Students for which the students and the faculty members can start preparations well in advance prior to the scheduled conference / seminar / workshop.
- The number of students going for any conference / seminar / workshop should be manageable.
- A proposal for the proposed conference / seminar / workshop should be drafted and presented to the HoI reflecting the following key points:
    - Entire activity plan
    - Route Map
    - What are the objectives for the students?
    - What they need to learn, do, and prepare before the conference / seminar / workshop?
    - List of prospective students with Contact Details
    - List of Faculty Coordinators with Contact Details
- After getting approval from the HoI, a note sheet should be prepared and all necessary permission and approval from the competent authorities should be obtained.
- The attention and co-operation of all students and parents are requested to attend the conference / seminar / workshop most effectively. Signing of the letter of Indemnity Bond (Consent-cum-Undertaking) is mandatory for all the parents of students going for conference / seminar / workshop in or outside Jaipur. Duly executed Indemnity Bond should be submitted to HoI Office at least 2 days prior to the visit, without which the accompanying Staff coordinator shall not permit the student to participate in the industrial visit
- The list of students participating in conference / seminar / workshop shall be handed over to the concerned HODs, Staff coordinators.

- Students should be present in formals.
- Students should carry the College Identity Cards during their journey.
- Discipline should be maintained during the conference / seminar / workshop. Any violation will be viewed very seriously.
- A report of the conference / seminar / workshop is to be submitted in 5 days time by students / faculty coordinators once the students are back.

The report to be prepared should reflect the following:-

- What happened at the conference / seminar / workshop the students attend and how does it relate in the best way to the preparations and the learning objectives.
- How do the students will use the outcome of conference / seminar / workshop after it is over?
- What will they gain from it and how can they set up activities that transfer the experience into learning?
- Evaluation parameters for the success of the experience of conference / seminar / workshop.

The layout guidelines for the Report:

1. File should be in the following specification:

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components:

- Front Page
- Table of Content
- Acknowledgement
- Student Certificate
- Company Profile (optional)
- Introduction
- Main Body
- References / Bibliography

ASSESSMENT OF THE PAPER PRESENTATION FILE

The student will be provided with the Student Assessment Record (SAR) to be placed in front of the Report File. Each item in the SAR is ticked off when it is completed successfully. The faculty will also assess each item as it is completed. The SAR will be signed by the student and by the faculty to indicate that the File is the student's own work. It will also ensure regularity and meeting the delaines.

Examination Scheme:

Components	**V**	**S**	**R**	**FP**
Weightage (%)	20	20	20	40

V – Viva, S – Synopsis, FP – Final Presentation, R - Report

SUMMER INTERNSHIP PROJECT

Course Code	L	T	P	Credit	SEMESTER
MCS 352	-	-	-	3	3

Course Learning Outcome:

CO1. Identify, Define and justify the scope of the proposed problem

CO3. Propose an optimized solution among the existing solutions

CO3. Apply to code, debugging, and testing tools for implementation

CO4. Prepare the proper documentation for report writing and oral presentation.

GUIDELINES:

There are certain phases of every Intern's professional development that cannot be effectively taught in the academic environment. These facets can only be learned through direct, on-the-job experience working with successful professionals and experts in the field. The internship program can best be described as an attempt to institutionalize efforts to bridge the gap between the professional world and the academic institutions. Entire effort in internship is in terms of extending the program of education and evaluation beyond the classroom of a university or institution. The educational process in the internship course seeks out and focuses attention on many latent attributes, which do not surface in the normal classroom situations. These attributes are intellectual ability, professional judgment and decision-making ability, inter-disciplinary approach, skills for data handling, ability in written and oral presentation, sense of responsibility etc.

In order to achieve these objectives, each student will maintain a file (**Internship File**). The Internship File aims to encourage students to keep a personal record of their learning and achievement throughout the Programme. It can be used as the basis for lifelong learning and for job applications. Items can be drawn from activities completed in the course modules and from the workplace to demonstrate learning and personal development.

The File will assess the student's analytical skills and ability to present supportive evidence, whilst demonstrating understanding of their organization, its needs and their own personal contribution to the organization.

The **layout guidelines** for the Project & Seminar Report

1. File should be in the following specification

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components

Front Page
Table of Content
Acknowledgement
Student Certificate
Company Profile (optional)
Introduction
Main Body
References / Bibliography

The File will include ***five sections*** in the order described below. The content and comprehensiveness of the main body and appendices of the report should include the following:

1. **The Title Page**--Title - An Internship Experience Report For (Your Name), name of internship organization, name of the Supervisor/Guide and his/her designation, date started and completed, and number of credits for which the report is submitted.
2. **Table of Content**--an outline of the contents by topics and subtopics with the page number and location of each section.
3. **Introduction**--short, but should include how and why you obtained the internship experience position and the relationship it has to your professional and career goals.
4. **Main Body**--should include but not be limited to daily tasks performed. Major projects contributed to, dates, hours on task, observations and feelings, meetings attended and their purposes, listing of tools and materials and their suppliers, and photographs if possible of projects, buildings and co-workers.
5. **References / Bibliography** --This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system

ASSESSMENT OF THE INTERNSHIP FILE

The student will be provided with the Student Assessment Record (SAR) to be placed in front of the Internship File. Each item in the SAR is ticked off when it is completed successfully. The faculty will also assess each item as it is completed. The SAR will be signed by the student and by the faculty to indicate that the File is the student's own work. It will also ensure regularity and meeting the delaines.

STUDENT ASSESSMENT RECORD (SAR)

1. Range of Research Methods used to obtain information

2. Execution of Research

3. Data Analysis
- Analyse Quantitative/ Qualitative information
- Control Quality

4. Draw Conclusions

Examination Scheme:

Components	V	S	R	FP
Weightage (%)	20	20	20	40

V – Viva, S – Synopsis, FP – Final Presentation, R - Report

Course Title: Anandam

Type: Compulsory

Semester III

Course Code: AND003 **Credit Units: 02**

Course Learning Outcomes:

The student should develop:

- Awareness and empathy regarding community issues
- Interaction with the community and impact on society
- Interaction with mentor and development of Student teacher relationship
- Interaction among students, enlarge social network
- Cooperative and Communication skills and leadership qualities
- Critical thinking, Confidence and Efficiency

Course Objectives:

After the completion of this course, students will be able to:

- apply their knowledge and skills to solve specific community problem
- learn to plan, lead, and organize community events have a sense of belonging to their college campus and community and find something they are interested in doing during their free time
- make new friends, expand social network, and boost social skills and mental health.
- be useful to society as it will protect them against stress, frustration, and depression

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants, phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page

- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.
- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.
3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
6. For the topic chosen by the group, students are recommended to cover the following points:
    a) Current scenario (Regional, national and international level as applicable)
    b) Future predictions
    c) Duty of the government
    d) Government policies (related to the topic), if any
    e) Duty of public
    f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
3. Conclusion is clearly stated. The underlying logic is explicit.

COMMUNICATION SKILLS-III

CODE	L	T	P/FW	CREDITS	SEMESTER
BCS311	1	-	-	1	3

Course Learning Outcome

1. Investigate their personal strengths and insights to be revealed in a Formal Setup of Communication.

2. Create right selection of words and ideas while choosing the appropriate channel of formal communication

3. Apply acquired knowledge with the appropriate selection of channel of formal communication.

4. Develop and empower self with the ease of using appropriate medium of communication.

Course Objective:

To initiate the learners with the basic mechanics of writing skills and facilitate them with the core skills required for communication in the professional world.

Course Contents:

Module I: Mechanics and Semantics of Sentences

Writing effective sentences
Style and Structure

Module II: Developing writing skills

Inter - office communication: Business Letter; E mails; Netiquette
Intra – office communication: Memos, Notices, Circulars, Minutes
Report Writing

Module III: Business Presentations

Planning, design and layout of presentation
Information Packaging
Audience analysis
Audio visual aids
Speaking with confidence
Case Studies
Video Resume

Social Media Profiling

Examination Scheme:

Components	CT1	CT2	CAF	V	GD	GP	A
Weightage (%)	20	20	25	10	10	10	5

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Krishnaswamy, N, Creative English for Communication, Macmillan
- Raman Prakash, Business Communication, Oxford.

BEHAVIOURAL SCIENCE-III (Leading Through Teams)

CODE	L	T	P/FW	CREDITS	SEMESTER
BSS311	1	-	-	1	3

Course Learning Outcome

i. Demonstrate knowledge of strategies for developing a healthy interpersonal communication

ii. Recognize the importance of transactional analysis, script analysis

iii. Identify the difference between healthy and unhealthy expression of emotions and develop emotional competence necessary for conflict resolution and impression management.

iv. Demonstrate knowledge of strategies for developing a healthy interpersonal relationship

Course Objective:

This course aims to enable students to:
Understand the concept and building of teams
Manage conflict and stress within team
Facilitate better team management and organizational effectiveness through universal human values.

Course Contents:

Module I: Teams: An Overview
Team Design Features: team vs. group
Effective Team Mission and Vision
Life Cycle of a Project Team
Rationale of a Team, Goal Analysis and Team Roles

Module II: Team & Sociometry
Patterns of Interaction in a Team
Sociometry: Method of studying attractions and repulsions in groups
Construction of sociogram for studying interpersonal relations in a Team

Module III: Team Building
Types and Development of Team Building
Stages of team growth
Team performance curve
Profiling your Team: Internal & External Dynamics
Team Strategies for organizational vision
Team communication

Module IV: Team Leadership & Conflict Management
Leadership styles in organizations
Self Authorized team leadership
Causes of team conflict
Conflict management strategies
Stress and Coping in teams

Module V: Global Teams and Universal Values
Management by values
Pragmatic spirituality in life and organization
Building global teams through universal human values
Learning based on project work on Scriptures like Ramayana, Mahabharata, Gita etc.

Module VI: End-of-Semester Appraisal
Viva based on personal journal

Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Examination Scheme:

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
Weightage (%)	20	05	20	30	25

Text & References:

- Organizational Behaviour, Davis, K.
- Hoover, Judhith D. Effective Small Group and Team Communication, 2002,Harcourt College Publishers
- LaFasto and Larson: When Teams Work Best, 2001, Response Books (Sage), New Delhi
- Dick, Mc Cann & Margerison, Charles: Team Management, 1992 Edition, viva books
- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer & Company
- Smither Robert D.; The Psychology of Work and Human Performance, 1994, Harper Collins College Publishers

FRENCH

CODE	L	T	P/FW	CREDITS	SEMESTER
FLT 311	2	-	-	2	3

Course Learning Outcome

1. Identify and express in French vocabulary and grammar norms
2. Interpret different types of texts as well as cultural ideas and themes.
3. Demonstrate comprehension of nuance between script and sound in French
4. Narrate clearly ideas, themes in simple standard French

Course Objective:

To provide the students with the know-how

- To master the current social communication skills in oral and in written.
- To enrich the formulations, the linguistic tools and vary the sentence construction without repetition.

Course Contents:

Module B: pp. 76 – 88 Unité 6

Module C: pp. 89 to103 Unité 7

Contenu lexical: **Unité 6: se faire plaisir**

1. acheter: exprimer ses choix, décrire un objet (forme, dimension, poids et matières) payer
2. parler de la nourriture, deux façons d'exprimer la quantité, commander un repas au restaurant
3. parler des différentes occasions de faire la fête

Unité 7: Cultiver ses relations

maîtriser les actes de la communication sociale courante (Salutations, présentations, invitations, remerciements)
annoncer un événement, exprimer un souhait, remercier, s'excuser par écrit.
caractériser une personne (aspect physique et caractère)

Contenu grammatical:

1. accord des adjectifs qualificatifs
2. articles partitifs
3. Négations avec de, ne…rien/personne/plus
4. Questions avec combien, quel…
5. expressions de la quantité
6. ne…plus/toujours - encore
7. pronoms compléments directs et indirects
8. accord du participe passé (auxiliaire « avoir ») avec l'objet direct
9. Impératif avec un pronom complément direct ou indirect
10. construction avec « que » - Je crois que/ Je pense que/ Je sais que

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1

GERMAN

CODE	L	T	P/FW	CREDITS	SEMESTER
FLG 311	2	-	-	2	3

Course Learning Outcome

1. understand and give instructions
2. understand and reply to a letter
3. speak about learning languages
4. find a particular information in a text
5. understand a conversation

Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.

To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany

Course Contents:

Module I: Modal verbs

Modal verbs with conjugations and usage

Imparting the finer nuances of the language

Module II: Information about Germany (ongoing)

Information about Germany in the form of presentations or "Referat"– neighbors, states and capitals, important cities and towns and characteristic features of the same, and also a few other topics related to Germany.

Module III: Dative case

Dative case, comparison with accusative case

Dative case with the relevant articles

Introduction to 3 different kinds of sentences – nominative, accusative and dative

Module IV: Dative personal pronouns

Nominative, accusative and dative pronouns in comparison

Module V: Dative prepositions

Dative preposition with their usage both theoretical and figurative use

Module VI: Dialogues

In the Restaurant,

At the Tourist Information Office,

A telephone conversation

Module VII: Directions

Names of the directions

Asking and telling the directions with the help of a roadmap

Module VIII: Conjunctions

To assimilate the knowledge of the conjunctions learnt indirectly so far

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH

CODE	L	T	P/FW	CREDITS	SEMESTER
FLS 311	2	-	-	2	3

Course Learning Outcome

1. Identify and express in Spanish vocabulary and grammar norms
2. Interpret different types of texts as well as cultural ideas and themes.
3. Demonstrate comprehension of nuance between script and sound in Spanish
4. Narrate clearly ideas, themes in simple standard Spanish

Course Objective:

To enable students acquire knowledge of the Set/definite expressions (idiomatic expressions) in Spanish language and to handle some Spanish situations with ease.

Course Contents:

Module I

Revision of earlier semester modules
Set expressions (idiomatic expressions) with the verb *Tener, Poner, Ir….*
Weather

Module II

Introduction to *Gustar*…and all its forms. Revision of *Gustar* and usage of it

Module III

Translation of Spanish-English; English-Spanish. Practice sentences.
How to ask for directions (using estar)
Introduction to IR + A + INFINITIVE FORM OF A VERB

Module IV

Simple conversation with help of texts and vocabulary
En el restaurante
En el instituto
En el aeropuerto

Module V

Reflexives

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras -Nivel Elemental

CHINESE

CODE	L	T	P/FW	CREDITS	SEMESTER
FLC 311	2	-	-	2	3

Course Learning Outcome

1. Read, write and speak approx. 100New Chinese words and understand basic grammar points.
2. Interpret words, phrases and sentences of Greetings, personal information like self-introduction, family, Hobbies, abilities Expression of gratitude apology etc.
3. Write Chinese characters, simple sentence and a paragraph on Greetings, personal information like self-introduction, family, Hobbies, abilities Expression of gratitude apology etc.

Course Objective:

Foreign words are usually imported by translating the concept into Chinese, the emphasis is on the meaning rather than the sound. But the system runs into a problem because the underlying name of personal name is often obscure so they are almost always transcribed according to their pronciation alone. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I

Drills
Dialogue practice
Observe picture and answer the question.
Introduction of written characters.
Practice reading aloud
Practice using the language both by speaking and by taking notes.
Character writing and stroke order

Module II

Measure words
Position words e.g. inside, outside, middle, in front, behind, top, bottom, side, left, right, straight.
Directional words – beibian, xibian, nanbian, dongbian, zhongjian.
Our school and its different building locations.
What game do you like?
Difference between “hii” and “neng”, “keyi”.

Module III

Changing affirmative sentences to negative ones and vice versa
Human body parts.
Not feeling well words e.g.; fever, cold, stomach ache, head ache.
Use of the modal particle "le"
Making a telephone call
Use of "jiu" and "cal" (Grammar portion)
Automobiles e.g. Bus, train, boat, car, bike etc.
Traveling, by train, by airplane, by bus, on the bike, by boat.. etc.

Module IV
The ordinal number "di"
"Mei" the demonstrative pronoun e.g. mei tian, mei nian etc.
use of to enter to exit
Structural particle "de" (Compliment of degree).
Going to the Park.
Description about class schedule during a week in school.
Grammar use of "li" and "cong".
Comprehension reading followed by questions.

Module V
Persuasion-Please don't smoke.
Please speak slowly
Praise – This pictorial is very beautiful
Opposites e.g. Clean-Dirty, Little-More, Old-New, Young-Old, Easy-Difficult, Boy-Girl, Black-White, Big-Small, Slow-Fast … etc.
Talking about studies and classmates
Use of "it doesn't matter"
Enquiring about a student, description about study method.
Grammar: Negation of a sentence with a verbal predicate.

Examination Scheme:

Components	**CT1**	**CT2**	**C**	**I**	**V**	**A**
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- "Elementary Chinese Reader Part I, Part-2" Lesson 21-30

PROJECT WORK / INTERNSHIP/ DISSERTATION

Course Code	L	T	P	Credit	SEMESTER
MCS460/461/462	-	-	-	25	4

Course Learning Outcome

CO1. Identify, Define and justify the scope of the proposed problem

CO3. Propose an optimized solution among the existing solutions

CO3. Apply to code, debugging, and testing tools for implementation

CO4. Prepare the proper documentation for report writing and oral presentation.

GUIDELINES FOR PROJECT FILE

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation.

Research is genuine exploration of the unknown that leads to new knowledge, which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals.
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

Report Layout

The report should contain the following components

1. File should be in the following specification

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5

- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components

Front Page
Table of Contents
Acknowledgement
Student Certificate
Company Profile
Introduction
Chapters
Appendices
References / Bibliography

- **Title or Cover Page or Front Page**

The title page should contain the following information: Project Title; Student's Name; Course; Year; Supervisor's Name.

- **Table of Contents**

Titles and subtitles are to correspond exactly with those in the text.

- **Acknowledgement**

Acknowledgment to any advisory or financial assistance received in the course of work may be given.

- **Student Certificate**

Given by the Institute.

- **Company Certificate & Profile**

This is a certificate, which the company gives to the students. A Company Profile corresponds to a file with company-specific data. Company data can be stored there and included in a booking when needed.

- **Introduction**

Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

- **Chapters**

All chapters and sections must be appropriately numbered, titled and should neither be too long nor too short in length.

The first chapter should be introductory in nature and should outline the background of the project, the problem being solved, the importance, other related works and literature survey. The other chapters would form the body of the report. The last chapter should be concluding in nature and should also discuss the future prospect of the project.

- **Appendices**

The Appendix contains material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

- **References / Bibliography**

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project. Project execution is concerned with assessing how much work has been put in.
The File should fulfill the following ***assessment objectives:***

1. Writing a critical literature review
    - Search for literature
    - Summarizing and presenting the literature
    - Evaluating key content and theories

2. Collecting and analyzing research material
    - Choosing and designing research method
    - Conducting the research
    - Analyzing, sorting and classifying the data to make decision

3. Interpreting research method and draw conclusion
    - Findings
    - Recommendation

4. Assigning the theories and writing the project report
    - Structuring the project in accordance with the given style

5. Bibliography
    - This refer to the books, Journals and other documents consulting while working on the project

Examination Scheme:

Components	MRP	V	S	FP	R
Weightage (%)	20	20	20	20	20

MRP – Mid Report Presentation, V – Viva, S – Synopsis, FP – Final Presentation, R - Report

Course Title: Anandam

Type: Compulsory

Semester IV

Course Code: AND004 **Credit Units: 02**

Course Learning Outcomes:

The student should develop:

- Awareness and empathy regarding community issues
- Interaction with the community and impact on society
- Interaction with mentor and development of Student teacher relationship
- Interaction among students, enlarge social network
- Cooperative and Communication skills and leadership qualities
- Critical thinking, Confidence and Efficiency

Course Objectives:

After the completion of this course, students will be able to:

- apply their knowledge and skills to solve specific community problem
- learn to plan, lead, and organize community events have a sense of belonging to their college campus and community and find something they are interested in doing during their free time
- make new friends, expand social network, and boost social skills and mental health.
- be useful to society as it will protect them against stress, frustration, and depression

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants, phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)

- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.
- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.
3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
6. For the topic chosen by the group, students are recommended to cover the following points:
    a) Current scenario (Regional, national and international level as applicable)
    b) Future predictions
    c) Duty of the government
    d) Government policies (related to the topic), if any
    e) Duty of public
    f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
3. Conclusion is clearly stated. The underlying logic is explicit.

Bachelor of Computer Applications (BCA)

Programme Code: 12048

Duration – 3 Years Full Time

Programme Structure
and
Curriculum & Scheme of Examination
2021-24

AMITY UNIVERSITY

RAJASTHAN

PREAMBLE

Amity University aims to achieve academic excellence by providing multi-faceted education to students and encourage them to reach the pinnacle of success. The University has designed a system that would provide rigorous academic programme with necessary skills to enable them to excel in their careers.

This booklet contains the Programme Structure, the Detailed Curriculum and the Scheme of Examination. The Programme Structure includes the courses (Core and Elective), arranged semester wise. The importance of each course is defined in terms of credits attached to it. The credit units attached to each course has been further defined in terms of contact hours i.e. Lecture Hours (L), Tutorial Hours (T), Practical Hours (P). Towards earning credits in terms of contact hours, 1 Lecture and 1 Tutorial per week are rated as 1 credit each and 2 Practical hours per week are rated as 1 credit. Thus, for example, an L-T-P structure of 3-0-0 will have 3 credits, 3-1-0 will have 4 credits, and 3-1-2 will have 5 credits.

The Curriculum and Scheme of Examination of each course includes the course objectives, course contents, scheme of examination and the list of text and references. The scheme of examination defines the various components of evaluation and the weightage attached to each component. The different codes used for the components of evaluation and the weightage attached to them are:

Components	Codes	Weightage (%)
Case Discussion/ Presentation/ Analysis	C	05 - 10
Home Assignment	H	05 - 10
Project	P	05 - 10
Seminar	S	05 - 10
Viva	V	05 - 10
Quiz	Q	05 - 10
Class Test	CT	10 - 15
Attendance	A	05
End Semester Examination	EE	50

It is hoped that it will help the students study in a planned and a structured manner and promote effective learning. Wishing you an intellectually stimulating stay at Amity University.

July, 2020

PROGRAMME LEARNING OUTCOME (PLO)

BACHELOR OF COMPUTER APPLICATIONS (BCA)

PLO -1 Analyze and apply foundational knowledge, and solve problems of both practical and theoretical nature.

PLO -2 Investigate and evaluate new technologies and their applications;

PLO -3 Utilize a variety of tools, techniques and programming languages and apply knowledge of computing, mathematics and science to real world problems;

PLO -4 Obtain employment as computer scientist in local and global industries and organization, where they are competent in applying the fundamental knowledge, computational principles and skills in computer science.

SKILL DEVELOPMENT DETAILS WITH CREDITS OF BCA PROGRAMME

Sr. No.	Sem	Skill Development	Credit	Employability	Credit	Entrepreneurship	Credit	Total Nos.	Total Credit
1	I	4	8	0	0	0	0	**4**	**8**
2	II	5	11	2	6	0	0	**7**	**17**
3	III	4	8	1	3	0	0	**5**	**11**
4	IV	5	11	4	8	0	0	**9**	**19**
5	V	8	16	0	0	0	0	**8**	**16**
6	VI	0	0	3	19	2	4	**5**	**23**
	Total	**26**	**54**	**10**	**36**	**2**	**4**	**38**	**94**

SKILL DEVELOPMENT SUBJECTS IN BCA PROGRAMME

Sem	Course Code	Course Name
I	BCI104	Programming and Problem solving through 'C' Language
I	BCI105	Computer Concepts and Problem Solving
I	BCI124	Programming and Problem solving through 'C' Language Lab
I	BCI125	Computer Concepts and Problem Solving Lab
II	BCI202	Introduction to Systems Analysis & Design
II	BCI203	Data Structures using C
II	BCI204	Introduction to Database Management Systems
II	BCI223	Data Structures using C LAB
II	BCI224	Introduction to Database Management Systems LAB
III	BCA302	Advance Database Management Systems
III	BCI303	Object Oriented Programming Concepts Using C++
III	BCA322	Advance Database Management Systems Lab
III	BCI323	Object Oriented Programming Concepts Using C++ Lab
IV	BCA405	Software Engineering
IV	BCI431	Introduction to .NET Technologies
IV	BCI432	Introduction to Open Source Technologies (PHP, MySql)
IV	BCI441	Introduction to .NET Technologies Lab
IV	BCI442	Introduction to Open Source Technologies (PHP, MySql) Lab
V	BCI502	Java Programming
V	BCI503	UNIX Operating System & Shell Programming
V	BCI522	Java Programming Lab
V	BCI523	UNIX Operating System & Shell Programming Lab
V	BCI533	Android Programming
V	BCA534	Web Programming
V	BCI543	Android Programming Lab
V	BCA544	Web Programming Lab
Employability		
Sem	**Course Code**	**Course Name**
II	BCI232	Internet Fundamental
II	BCI233	Cyber Security
III	BCI332	Web Designing
IV	BCA434	Cloud Computing
IV	BCA435	Big Data Analytics
IV	BCA444	Cloud Computing Lab
IV	BCA445	Big Data Analytics Lab
VI	BCA602	Introduction to Python Technologies
VI	BCA622	Introduction to Python Technologies Lab
VI	BCA660	Major Project

Entrepreneurship

Sem	Course Code	Course Name
VI	BCA601	Web Technologies
VI	BCA621	Web Technologies Lab

PROGRAMME STRUCTURE CREDITS SUMMARY
Bachelor of Computer Applications (BCA)-2021

	Credits UG (3 years/ 6 Semesters)							
Semester	CC	DE	VA	OE	EVS	NTCC	ANDP	Total
I	17	0	04	0	0	0	02	23
II	14	03	04	03	0	0	02	26
III	11	03	04	03	04	03	02	30
IV	16	04	04	03	0	03	02	32
V	11	04	04	03	0	03	02	27
VI	08	0	0	0	0	15	0	23
Total	77	14	20	12	4	24	10	161

Core Courses	CC
Domain Electives	DE
Value Added Course	VA
Open Electives	OE
Environmental Science	EVS
Project Work (Non Teaching Credit Course)	NTCC
Anandam Project	NTCC

PROGRAMME STRUCTURE SUBJECTWISE CATEGORY SUMMARY

Bachelor of Computer Applications (BCA)-2021

	Courses/Subjects UG (3 years/ 6 Semesters) Programmed							
Semester	CC	DE	VA	OE	EVS	NTCC	ANDP	Total
I	07	0	06	0	0	0	01	14
II	06	03	06	01	0	0	01	17
III	05	03	06	01	01	01	01	18
IV	06	10	06	01	0	01	01	25
V	05	08	06	01	0	01	01	22
VI	04	0	0	0	0	01	0	05
Total	33	24	30	04	01	04	05	101

Core Courses	CC
Domain Electives	DE
Value Added Course	VA
Open Electives	OE
Environmental Science	EVS
Project Work (Non Teaching Credit Course)	NTCC
Anandam Project	NTCC

PROGRAMME STRUCTURE

Programme Structure
Bachelor of Computer Application -BCA
2021-24

FIRST SEMESTER

CODE	COURSE	CATEGORY	L	T	P/FW	CREDIT UNITS
BCA101	Digital Electronics	CC	2	1	-	3
BCI102	Basic Mathematics	CC	2	1	-	3
BCI103	Introduction to Computer Networking	CC	2	1	-	3
BCI104	Programming and Problem solving through 'C' Language	CC	2	1	-	3
BCI105	Computer Concepts and Problem Solving	CC	2	1	-	3
BCI124	Programming and Problem solving through 'C' Language Lab	CC	-	-	2	1
BCI125	Computer Concepts and Problem Solving Lab	CC	-	-	2	1
Non Teaching Credit Course (NTCC)						
AND001	Anandam-I	NTCC	-	-	-	2
VALUE ADDED COURSES						
BCS 101	English	VA	1	-	-	1
BSS 103	Behavioural Science-I (Understanding Self for Effectiveness)	VA	1	-	-	1
FLT 101 FLG 101 FLS 101 FLC 101	Foreign Language - I French German Spanish Chinese	VA	2	-	-	2
	TOTAL					**23**

SECOND SEMESTER

CODE	COURSE	CATEGORY	L	T	P/FW	CREDIT UNITS
BCA201	Discrete Mathematical Structures with Application to CS	CC	2	1	-	3
BCI202	Introduction to Systems Analysis & Design	CC	2	1	-	3
BCI203	Data Structures using C	CC	2	1	-	3
BCI204	Introduction to Database Management Systems	CC	2	1	-	3
BCI223	Data Structures using C LAB	CC	-	-	2	1
BCI224	Introduction to Database Management Systems LAB	CC	-	-	2	1
DE Elective: Choose any one course from the following courses						
BCI231	Networking for Home & Small Business	DE	2	1	-	3
BCI232	Internet Fundamental					
BCI233	Cyber Security					
OPEN ELECTIVE						
	Open Elective	OE	2	1	-	3
Non Teaching Credit Course (NTCC)						
AND002	Anandam-II	NTCC	-	-	-	2
VALUE ADDED COURSES						
BCS 201	English	VA	1	-	-	1
BSS 203	Behavioural Science – II (Problem Solving and Creative Thinking)	VA	1			1
FLT 201 FLG 201 FLS 201 FLC 201	Foreign Language - II French German Spanish Chinese	VA	2	-	-	2
	TOTAL					**26**

SUMMER PROJECT – I

THIRD SEMESTER

CODE	COURSE	CATEGORY	L	T	P/FW	CREDIT UNITS
BCA301	Computer Oriented Statistical & Optimization Methods	CC	2	1	-	3
BCA302	Advance Database Management Systems	CC	2	1	-	3
BCI303	Object Oriented Programming Concepts Using C++	CC	2	1	-	3
BCA322	Advance Database Management Systems Lab	CC	-	-	2	1
BCI323	Object Oriented Programming Concepts Using C++ Lab	CC	-	-	2	1
EVS 001	Environmental Studies	EVS	4	-	-	4
Domain Elective : Choose any one from the following courses						
BCI331	Working at a Small-to-Medium Business or ISPs	DE	2	1	-	3
BCI332	Web Designing	DE				
BCI333	Advance Technologies in Computer Science	DE				
OPEN ELECTIVE						
	Open Elective	OE	2	1	-	3
Non Teaching Credit Course (NTCC)						
BCA351	Summer Project – I	NTCC	-	-	-	3
AND003	Anandam-III	NTCC	-	-	-	2
VALUE ADDED COURSES						
BCS 301	Communication Skills – I	VA	1	-	-	1
BSS 303	Behavioural Science - III (Interpersonal Communication and relationship Management)	VA	1	-	-	1
FLT 301 FLG 301 FLS 301 FLC 301	Foreign Language - III French German Spanish Chinese	VA	2	-	-	2
	TOTAL					**30**

FOURTH SEMESTER

CODE	COURSE	CATEGORY	L	T	P/FW	CREDIT UNITS
BCI401	Computer Graphics	CC	2	1	-	3
BCI402	Design & Analysis of Algorithms	CC	2	1	-	3
BCI403	Operating Systems	CC	2	1	-	3
BCA404	Computer Oriented Numerical Methods	CC	2	1	-	3
BCA405	Software Engineering	CC	2	1	-	3
BCI421	Computer Graphics Lab	CC	-	-	2	1
Domain Elective : Choose any one from the following courses						
BCI431	Introduction to .NET Technologies	DE	2	1	-	3
BCI432	Introduction to Open Source Technologies (PHP, MySql)	DE				
BCI433	Introducing Routing & Switching in the Enterprise	DE				
BCA434	Cloud Computing	DE				
BCA435	Big Data Analytics	DE				
BCI441	Introduction to .NET Technologies Lab	DE	-	-	2	1
BCI442	Introduction to Open Source Technologies (PHP, MySql) Lab	DE				
BCI443	Introducing Routing & Switching in the Enterprise Lab	DE				
BCA444	Cloud Computing Lab	DE				
BCA445	Big Data Analytics Lab	DE				
OPEN ELECTIVE						
	Open Elective	OE	2	1	-	3
Non Teaching Credit Course (NTCC)						
BCA450	Minor Project	NTCC	-	-	-	3
AND004	Anandam-IV	NTCC	-	-	-	2
VALUE ADDED COURSES						
BCS 401	Communication Skills – II	VA	1	-	-	1
BSS 403	Behavioral Science - IV (Group Dynamics & Team Building)	VA	1	-	-	1
FLT 401 FLG 401 FLS 401 FLC 401	Foreign Language - IV French German Spanish Chinese	VA	2	-	-	2
	TOTAL					**32**

SUMMER PROJECT – II

FIFTH SEMESTER

CODE	COURSE	CATEGORY	L	T	P/FW	CREDIT UNITS
BCA501	Systems Software	CC	2	1	-	3
BCI502	Java Programming	CC	2	1	-	3
BCI503	UNIX Operating System & Shell Programming	CC	2	1	-	3
BCI522	Java Programming Lab	CC	-	-	2	1
BCI523	UNIX Operating System & Shell Programming Lab	CC	-	-	2	1
Domain Elective : Choose any one from the following courses						
BCI531	Designing & Supporting Computer Network	DE	2	1	-	3
BCI532	Data Warehousing & Data Mining	DE				
BCI533	Android Programming	DE				
BCA534	Web Programming	DE				
BCI541	Designing & Supporting Computer Network Lab	DE	-	-	2	1
BCI542	Data warehousing & Data Mining Lab	DE				
BCI543	Android Programming Lab	DE				
BCA544	Web Programming Lab	DE				
OPEN ELECTIVE						
	OPEN ELECTIVE	OE	2	1	-	3
Non Teaching Credit Course (NTCC)						
BCA551	Summer Project – II	NTCC	-	-	-	3
AND005	Anandam-V	NTCC	-	-	-	2
VALUE ADDED COURSES						
BCS 501	Communication Skills – III	VA	1	-	-	1
BSS 503	Behavioural Science - V (Individual Society and Nation)	VA	1	-	-	1
FLT 501 FLG 501 FLS 501 FLC 501	Foreign Language - V French German Spanish Chinese	VA	2	-	-	2
	TOTAL					**27**

SIXTH SEMESTER

CODE	COURSE	CATEGORY	L	T	P/FW	CREDIT UNITS
BCA601	Web Technologies	CC	2	1	-	3
BCA602	Introduction to Python Technologies	CC	2	1		3
BCA621	Web Technologies Lab	CC	-	1	2	1
BCA622	Introduction to Python Technologies Lab	CC	-	-	1	1
Non Teaching Credit Course (NTCC)						
BCA660	Major Project	NTCC	-	-	-	15
		TOTAL				**23**

DIGITAL ELECTRONICS

Course Code	Credit Units	Semester
BCA 101	**03**	**01**

CLO 1: Understand the fundamental concepts of digital electronic
CLO 2: To construct, analyze, and design combinational logic circuits
CLO 3: To construct, analyze, and design sequential circuit
CLO 4: To understand about digital to analog conversion and vice versa

Course Contents:

Module I: Number System

Decimal, Binary, Octal, Hexadecimal Number Systems and Conversion of the bases.

Introduction to logic systems

Positive and negative logic, Logic functions - NOT, AND, OR, NOR, EX-OR, EX NOR
Truth tables Boolean algebra, De Morgan's theorems Standard forms for Logical Expressions - Sum of Products, Product of Sums Specification of Logical functions in terms of Minterms and Maxterms, Karnaugh Maps, Simplification of Logical functions, Introduction of "don't care" states.

Module II: Combinational Building Blocks

Multiplexers, Decoders, Encoders

Arithmetic circuits

Half Adders and Full Adders**,** Half Subtractor and Full Subtractor, Representation of negative numbers, revisited

Module III: Flip-flops

The RS latch, the clocked RS flip-flop, JK Flip Flop,the Master-Slave JK flip-flop, Delay and Toggle flip-flops

Flip-flops in counter circuits

Asynchronous (ripple) Counters (UP/DOWN), Synchronous Counter design (UP/DOWN), Non Sequential Counting

Module IV: Shift Registers

Shift registers in general, Ring Counters, Johnson Counter

Introduction to Memory

Primary: RAM, Static RAM, Dynamic RAM, ROM, PROM, EAPROM, Secondary: Floppy Disk, Hard Disk, CDROM

Module V: DACs and ADCs

Binary weighted resistor DAC, Resolution, linearity and settling time of DACs, Successive approximation ADC

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- R.P Jain, Modern Digital Electronics

References:

- Malvino & Leach, Digital Electronics
- Floyd, Digital Fundamentals
- M.M Mano, Digital Logic and Computer Design
- Gothman, Digital Electronics

BASIC MATHEMATICS

Course Code	Credit Units	Semester
BCI 102	**03**	**1**

CLO1. Identify matrix operations.

CLO2. Understand the meaning of limit , continuity and differentiation.

CLO3. Evaluate a definite integral using the Fundamental Theorem of Calculus.

CLO4. Identify a general method for constructing solutions to inhomogeneous linear constant-coefficient Second-order equations.

CLO5. Demonstrate Scalar multiplication, magnitude, Vector multiplication and Simple application of Vectors, slope of straight line, centre, radius and equation of circle.

Course Contents:

Module I: Matrix
Matrices: Matrix, Sub matrix, types of matrices, such as symmetric, square, diagonal matrices, singular and nonsingular matrices. Addition, Subtraction, multiplication of matrices, determinant, inverse of matrix, matrix equation, Solution by Cramer's rule, Matrix inversion Method.

Module II: Continuity and Differentiation
Limit and Continuity: Concept of limit, definition of continuity, kinds of discontinuity, simple problem based on continuity .
Differentiation of function, Derivative of some common functions, polynomial, rational, exponential, logarithmic and trigonometric functions.
Successive differentiation, Leibnitz theorem.

Module III: Integration
Integration as inverse process of differentiation, integration of simple functions, method of change of variable and substitution for integrals, integration by parts and partial fraction. definite integrals.

Module IV: Differential equations
Differential equations of first order, Differential equations of second order with constant coefficients

Module V: Vectors and 2-Dimensional Geometry
Vector, Vector Algebra: addition, subtraction, Scalar Multiplication. Magnitude, Vector multiplication, Simple application of Vectors.
Straight line and Circle: Concept of straight line, slope form , intercept form and problem based on Circle.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:
Engineering Mathematics, E. Kreyig
References:
Higher Engineering Mathematics, B. S. Grewal
Differential Calculus, Shanti Narayan

INTRODUCTION TO COMPUTER NETWORKING

Course Code	Credit Units	Semester
BCI 103	**03**	**1**

CLO 1: Able to understand the computer networking principals and its applications in our world.
CLO 2: To understand how computer networks work, and its fundamentals when implemented for real world.
CLO 3: To understand various modulation techniques and how they are used to improve network performance.
CLO 4: To be able to understand the working of various network layer protocols such as TCP, IP etc.

Course Contents:

Module I

Introduction to Data Communication, Networks-protocols, advantages, disadvantages & applications, Line Configuration, topology, Transmission mode, Classification of networks.
Parallel & Serial Transmissions, Analog & Digital Signals, Periodic & Aperiodic Signals, Modulation--- Amplitude Modulation, Frequency Modulation, Phase Modulation, Pulse Amplitude Modulation, Pulse Code Modulation, Sampling.

Module II

Amplitude Shift Keying, Frequency Shift Keying, Phase Shift Keying, Bit/ Baud Comparison, DTE-DCE Interface, 56 K Modem, Cable Modem.
OSI Model, Transmission Media-Twisted Pair Cable, Coaxial Cable, Fiber-Optics Cable, Radio frequency Allocation, Terrestrial Microwave, Infrared rays, Satellite Communication, Cellular Telephony. Introduction to ISDN.

Module III

Framing, Line Discipline, Types of Errors, Error Detection & Correction (VRC, LRC, CRC, Checksum, Hamming Code), Flow Control (Stop-and-wait & Sliding Window), Error Control (Stop & Wait ARQ, Sliding Window ARQ using Go-back n method and Selective-Reject).
CSMA/CD, Project 802, IEEE Standards-802.3, Token Bus (802.4), Token Ring (802.5), Introduction to Bridges.

Module IV

Internal Organization of Network Layer, Routing Algorithms-Shortest Path Routing, Flooding, Distance Vector Routing, Link State Routing, General Principles of Congestion, Congestion Prevention Policies.
Duties of Transport Layer, Connection Establishment & Connection Termination.

Module V

Introduction to TCP/IP, Data Link Layer in Internet-SLIP & PPP, Network Layer in Internet-IP protocol, IP addressing, Subnetting & Internet Control Protocols, Transport Layer in Internet-TCP & UDP.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Behrouz ., Forouzan., “Data Communication and Networking”, TMH
- W. Stallings, "Data and Computer Communication" PHI
- A.S. Tanenbaum, "Computer Networks" , PHI
- Kennedy, “Electronics Communication System”, TMH

PROGRAMMING AND PROBLEM SOLVING THROUGH 'C' LANGUAGE

Course Code	Credit Units	Semester
BCI 104	**03**	**1**

CLO 1: Identify different programming approaches in procedural programming.
CLO 2: Analyse and critically evaluate various programming approaches which will help in implementation of different application or projects.
CLO 3: Select and implement different programming approach concepts in project or application development.
CLO 4: Demonstrate awareness of programming paradigm in terms of understanding the concept of application development.

Course Contents:

Module I: Introduction to Computer Fundamentals

Basic Computer Organization, Computer Hardware Components, Disk, Primary and Secondary Memory, Keyboard, Mouse, Printer, Monitor, CD etc. Computer Software: Introduction to Application software, System Software, Compilers, Interpreters etc. Basic Operating System Concepts, Functional knowledge of MSDOS and WINDOWS.

Number System-Binary, Hexadecimal, Octal, and Decimal.Conversion from one number system to another. Computer Codes - ASCII

Module II: Introduction to 'C' Language

Character set, Variables Identifiers, Data type, Arithmetic operation, Constant, operators, Expression, Assignments, basic input/output statements, Simple 'C. Programs.

Decision making in program, Relational Logical operators, if statements, if -else, nested if-else statements, Switch, case loop, Do-While, While, for loop and nesting of loop.

Module III: Arrays and Functions

One Dimensional Arrays, Arrays Manipulation, Sorting, Searching, Problems solving Top down Approach, Modular Programming and functions, Passing Arguments, call by value and call by references, Recursive function, .Recursion,

Module IV: Pointers

Pointers: Declaration, Pointer assignments, initialization, Pointers and Dynamic Memory Allocation , Discuss Array of Pointers .

Module V: Structure and Union

Structure definition, Declaration, structure Assignments, Arrays in structure, Structure Arrays, Pointer Structure, Nested Structure, Arrays and Arrays of Structure, Union and File Handling

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Problem Solving through C language, E. Balagurusamy, TMH publication.
- Peter Nortons, "Introduction to Computers", TMH

References:

- Let us C, YashwantKanetkar, BPB Publication.
- P.K. Sinha, "Computer Fundamentals", BPB Publications
- V. Rajaraman, "Computer Fundamentals", Prentice Hall
- Y. Kanetkar, "Let us C", BPB Publications.

COMPUTER CONCEPTS & PROBLEM SOLVING

Course Code	Credit Units	Semester
BCI 105	03	1

CLO1: Identify different programming approaches in procedural programming.
CLO2: Analyse and critically evaluate various programming approaches which will help in implementation of different application or projects.
CLO3: Select and implement different programming approach concepts in project or application development. CLO4: Demonstrate awareness of programming paradigm in terms of understanding the concept of application development.

Course Contents:

UNIT I FUNDAMENTALS OF COMPUTERS

Evolution of Computers, Inputs/Outputs devices, Alternative Methods of Input, Organization of Modern Digital Computers, Operating System, Multitasking OS, Graphical User Interface.

UNIT II WORD PROCESSING

Word Processing Programs and Their Uses, Word Processor's Interface, Editing Text Formatting Text, Macro, Special Features of Word, Desktop Publishing Service, Converting doc into www pages.

UNIT III SPREADSHEET SOFTWARE

Spreadsheet Programs, Applications, Spreadsheet package features, attributes, structure, label, data, importing data, formula, functions, data handling, Managing workbooks.

UNIT IV INTRODUCTION TO COMPUTER PROBLEM SOLVING

Introduction, Problem Solving aspects, Top-Down Design-Implementation of Algorithms, Program Verification-Efficiency of Algorithm, Analysis of Algorithm fundamental algorithm, factorial computation, generation of Fibonacci sequence.

UNIT V FACTORING AND ARRAY TECHNIQUES

Factoring Methods, finding the square root of a number, generating prime numbers, Array techniques, array order reversal, Finding the maximum number in a set, Removal of duplicates from an ordered Array-finding the k^{th} smallest element.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

1. V.Rajaraman "Computer Programming in C" Prentice Hall of India, New Delhi, 2001
2. Kamthane, A.N., "Programming with ANSI and Turbo C", Pearson Education, Delhi, 2006.
3. Yashavant P. Kanetkar "Pointers In C", BPB Publications, NewDelhi, 2002
4. E.Balagurusamy "Programming in ANSI C", Tata McGraw Hill, 2004
5. Deitel and Deitel "C How to Program", Addisson Wesley, 2001

PROGRAMMING AND PROBLEM SOLVING THROUGH 'C' LANGUAGE LAB

Course Code	Credit Units	Semester
BCI 124	**01**	**1**

CLO 1: Identify different programming approaches in procedural programming.
CLO 2 : Analyse and critically evaluate various programming approaches which will help in implementation of different application or projects.
CLO 3: Select and implement different programming approach concepts in project or application development.
CLO 4 : Demonstrate awareness of programming paradigm in terms of understanding the concept of application development.

1. Write a program to find the area and perimeter of (I) square (ii) rectangle.
2. Write a Program to find the sum of first n natural numbers.
3. Write a program to calculate the average of n numbers.
4. Write a program to check whether the number is even or odd.
5. Write a program to find largest of three numbers.
6. Write a program to swap the values of two given variables.
7. Write a program to find the square of a given number.
8. Write a program to calculate the roots of a quadratic equation.
9. Write a program to compute the sum of squares of n natural numbers.
10. Write a program to reverse a given number and also calculate the number of digits in the number.
11. Write a program to calculate the sum of digits of a given number.
12. Write a program to calculate the factorial of a given positive number.
13. Write a program to generate fibonaaci series upto n terms.
14. Write a program to find the GCD and LCM of two given positive numbers.
15. Write a program to print first n prime numbers.
16. Write a program to print 1 if input character is capital, 2 if input character is a lowercase alphabet, 3 if input character is a digit and 4 if some other special character.
17. Write a C program to check whether a number is an Armstrong number.
18. Write a C program to find the power of a number.
19. Write a C program to find the sum of n terms of the series: n-n*2/2!+n*3/3!-n*4/4!+…….
20. Write a C program to find the maximum/minimum number in a given array.
21. Write a C program to search a number in an array using linear search.
22. Write a C program to sort a given array using Bubble sort.
23. Write a C program to concatenate two one-dimensional arrays.
24. Write a C program to add, subtract and multiply two m by n matrices.
25. Write a C program to detect the occurrence of a character in a given string.
26. Write a C program to count the number of characters in a given string with and without using strlen () function,
27. Write a C program to copy the contents of one string to another with and without using strcpy () function.
28. Write a C program to determine whether the entered character string is palindrome or not.
29. Write a C program to enter the marks, address of several students and prepare the mark sheet of each student. Use structures.
30. Write a C program to calculate net salary / printing of salary statement of an employee. Use Structures.
31. Write a C program to calculate the factorial of a number using recursion.
32. Write a C program to generate a fibonacci series using recursion.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

COMPUTER CONCEPTS & PROBLEM SOLVING LAB

Course Code	Credit Units	Semester
BCI 125	**01**	**1**

CLO 1: Recognize the concept of Computer Organization.
CLO 2: Identify the utility of various office package tools and their application.
CLO 3: Describe problem solving approach through the design and implementation of algorithm.
CLO 4: Apply hands on real time development of algorithm based on various techniques.

Course Contents:

1 Program to find sum of two numbers
2 Program to find area and circumference of circle. [A=3.14*R*R & C=2*3.14*R]
3 Program to find the simple interest. [SI=(P*R*T)/100]
4 Program to convert temperature from degree centigrade to Fahrenheit. [F=(1.8*C)+32]
5 Program to calculate sum of 5 subjects & find percentage
6 Program to use bitwise AND & OR operator between the two integers
7 Program to shift inputted data by two bits to the left
8 Program to show swap of two no's without using third variable
9 Program to find gross salary.
[Gross Salary= Basic salary + T.A. (12% of Basic) + D.A. (10% of basic)]
10 Program to find greatest in 3 numbers
11 Program to show the use of conditional operator
12 Program to find that entered year is leap year or not
13 Program to find whether given no is even or odd
14 Program to use switch statement. Display Monday to Sunday.
15 Program to display arithmetic operation using switch case.
16 Program to print a table of any number.
17 Program to display first 10 natural no & their sum.
18 Program to reverse a given number.
19 Program to print stars Sequence1

```
*
* *
* * *
* * * *
* * * * *
```

20 Program to print stars Sequence2

```
*
* *
* * *
* * * * *
* * * *
* * *
* *
*
```

21 Program to print star Sequences3

```
    *
  *   *
```

```
   *   *   *
  *   *   *   *
```

22 Program to print Fibonacci series up to 100
23 Program to find factorial of a number. [Ex: 5! = 5*4*3*2*1]
24 Program to find whether given no is a prime number or not
25 Program to show sum of 10 elements of array & show the average
26 Program to find the maximum no in an array
27 Program to display matrix
28 Program to find sum of two matrices
29 Program to find subtraction of two matrices
30 Program to find multiplication of two matrices

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

Anandam

Course Code	L	T	P	Credit	Semester
AND001	2	0	0	2	I

Course Learning Outcome:

CLO1: Awareness and empathy regarding community issues
CLO2: Interaction with the community and impact on society
CLO3: Interaction with mentor and development of Student teacher relationship
CLO4: Interaction among students, enlarge social network
CLO5: Cooperative and Communication skills and leadership qualities Critical thinking, Confidence and Efficiency

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants, phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.
- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.
3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.

6. For the topic chosen by the group, students are recommended to cover the following points:
    a) Current scenario (Regional, national and international level as applicable)
    b) Future predictions
    c) Duty of the government
    d) Government policies (related to the topic), if any
    e) Duty of public
    f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
3. Conclusion is clearly stated. The underlying logic is explicit.

ENGLISH

Course Code	Credit Units	Semester
BCS 101	**01**	**1**

A. COURSE LEARNING OUTCOMES (CLO)

CLO 1	**Identify** the basic elements of grammar required for good and effective communication.
CLO 2	**Interpret and discuss** key ideas of grammar, diction and communication.

CLO 3	**Develop** Creative & Literary Sensitivity in all communication.
CLO 4	**Design** and create texts for a variety of purposes and audiences, evaluating and assessing the effectiveness of grammatical aspects.

B. SYLLABUS

Topic
Vocabulary development- Root Words, Affixes, Synonyms, Antonyms, One Word Substitution
Grammar: Fluency and Expression
Tenses
Voices
Tag Questions
Sentence Formation
Communication Essentials, Basics of Communication, Communication Circle

EXAMINATION SCHEME:

Components	CT/Mid-term	Project/ Presentation	Assignment 1	Quiz	Attendance	EE
Weightage (%)	15	10	10	10	5	50

SUGGESTED READINGS

- Martin Hewings, *Advance English Grammar*. Cambridge University Press
- J.V.Vilanilam. *More Effective Communication.* Response Books:NewDelhi
- Wren and Martin, *English Grammar & Comosition*. S.Chand & Co. Ltd.
- Dr. P.Prasad. *Communication Skills*.S.K.Kataria &Sons
- Kavita Sharma, *New Upgraded Encyclopedia of English Grammar & Composition.* English Edition Publishers
- Raman, Meenakshi and Sangeeta Sharma, *Technical Communication: Principles and Practice.* OUP: New Delhi, 2004.Print.
- Koneru, Aruna. *Professional Communication.* The McGraw Hill: New Delhi, 2008. Print
- Krishnaswamy N, *Creative English for Communication***.** Delh**i:** Macmillan Publishers India Ltd. Print. 2007.

BEHAVIOURAL SCIENCE – I
(UNDERSTANDING SELF FOR EFFECTIVENESS)

Course Code	Credit Units	Semester
BSS 103	01	1

Course learning outcomes (CLOs)

At the successful completion of this course you (the student) should be able to:

- Demonstrate awareness of self and the process of self-exploration.
- Demonstrate knowledge of strategies for developing a healthy self-esteem.
- Recognize the importance of attitudes and its effect on personality.
- Identify the difference between healthy and unhealthy expression of emotions and develop emotional competence necessary for personal and professional life.

Course Objective:

- This course aims at imparting an understanding of:
- Self and the process of self exploration
- Learning strategies for development of a healthy self esteem
- Importance of attitudes and its effect on personality
- Building emotional competence

Course Contents:

Module I: Self: Core Competency
Understanding of Self
Components of Self – Self identity
Self concept
Self confidence
Self image

Module II: Techniques of Self Awareness
Exploration through Johari Window
Mapping the key characteristics of self
Framing a charter for self
Stages – self awareness, self acceptance and self realization

Module III: Self Esteem & Effectiveness
Meaning & Importance
Components of self esteem
High and low self esteem
Measuring your self esteem

Module IV: Building Positive Attitude
Meaning and Nature of Attitude
Components and Types of Attitudes
Relevance and Importance of Attitudes

Module V: Building Emotional Competence
Emotional Intelligence – Meaning, Components, Importance and Relevance
Positive and Negative Emotions
Healthy and Unhealthy expression of Emotions

Examination Scheme:

Components	SAP	JOS	FC/MA/CS/HA	P/V/Q	A
Weightage (%)	25	15	30	25	05

SAP- Social Awareness Programme; **JOS**-Journal of Success; **HA**-Home Assignment; **P**-Presentation; **V**-Viva; **Q**-Quiz; **FC-** Flip class; **MA-** Movie Analysis; **CS-** Case study; **A**-Attendance

Text & References:

- Dressler, David and Cans, Donald: The Study of Human Interaction
- Lindzey, G. and Borgatta, E: Sociometric Measurement in the Handbook of Social Psychology, Addison – Welsley, US.
- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer & Company

FRENCH - I

Course Code	Credit Units	Semester
FLT 101	02	1

Program Learning Outcomes:

- To produce global citizens speaking an International language in keeping with the institutional vision.
- To give students a platform to understand Culture and Society of a different world.
- To enhance the possibilities of jobs in MNCs established in/outside the country.
- To enhance the possibilities of Studying Abroad

Course Learning Objective:

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts.
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self introduction, family description etc.
- To tell ones name and to spell it
- To understand the French keyboard
- To wish/welcome/identify/name someone
- To present oneself and someone else
- To fill a form
- To ask for information
- To understand and ask simple questions

Course Contents:

Unité 1 Premiers pas en France. Page: 1-17 Leçons 0, 1, 2 & 3

Contenu Lexical:

Les mots transparent (en sciences)
Quelquesprénomsfrançais
La prise de contact
La politesse
Les salutations
La famille
Les présentations
Quelquesspécialitésscientifiques
Les Chiffres de 0 à 20
Les ordinaux
L'adressepostale
L'adresse mail
Le numéro de téléphone

Contenu Grammatical:

Les accents
Etre au présent
Les articles indéfinis
Les pronomspersonnels
Le feminin et le masculin
Les prépositions de lieu
Les articles définis
Avoir, étudier, habiter au présent, Les verbs du 1 er groupe au présent
Les adjectifspossessifs au singulier
Les pronomstoniques
L'interrogation

EXAMINATION SCHEME

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					End Sem Evaluation (Total 50 Marks)
Quiz	**Mid Term Test**	**Presentation**	**Viva Voce**	**Attendance**	**End-Term Exam**
10	**15**	**10**	**10**	**5**	**50**

Text & References:

Le Gargasson, I. Naik, S. Chaize, C. (2012) Tech French, Delhi : Goyal Publications
Ray. A, Robert (2010) Le Petit Robert French Dicitionary, Paris: Le Robert
Robert, Collins (2006) Collins Robert French Dictionary, Paris : Harper Collins

GERMAN - I

Course Code	Credit Units	Semester
FLG 101	**02**	**1**

Program Learning Outcomes:

- To produce global citizens speaking an International language in keeping with the institutional vision.
- To give students a platform to understand Culture and Society of a different world.
- To enhance the possibilities of jobs in MNCs established in/outside the country.
- To enhance the possibilities of Studying Abroad

Course Learning Objective:

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts.
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self introduction, family description etc.

After successful completion of the course, students will be able to express simple vocabulary in oral and writing German language.

After successful completion of this semester, students will be able to:

- greeting formally and informally.
- self introduction
- countings from 1 To 100
- make simple sentences using present tense
- spelling names.
- describing objects with articles in the classroom

Course Contents:
Vocabulary:

- Personal information like age, name etc.
- Alphabets
- Greetings: Good morning, good afternoon, good evening,
- Parting good bye Etc.
- describing objects with articles in the classroom

Grammar:

- Personal Pronouns
- Use of verbs>**to be**< and >**to have**<in simple present tense
- Use of regular verbs liketo live, to go, to learn etc.

- Using definite and indefinite article in German in nominative case
- Interrogative pronouns> **who, what, where, where from, where to<**
- talk about gender, numbers and articles.
- Singular and plural
- Basic Phonetics: Consonants and Vowels

EXAMINATION SCHEME

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					**End Sem Evaluation (Total 50 Marks)**
Quiz	**Mid Term Test**	**Presentation**	**Viva Voce**	**Attendance**	**End-Term Exam**
10	**15**	**10**	**10**	**5**	**50**

Prescribed Text-Book: First 10 Lessons from Deutschals Fremdsprache -1A, IBH & Oxford, New Delhi, 1977

References: Studio D A1 by Hermann Funk, Christina Kuhn and Silke Demme, Cornelsen, 2013
Tangram A1by Rosa Maria Dallapiazza, Eduard von Jan & Till Schoenherr, Max Hueber, 2007
Sprach training A1 by Rita Maria Niemann, Dong Ha Kim, Cornelsen, 2013
Dictionaries for reference: Studio D: Glossar A1 - Deutsch – Englisch, Cornelsen, 2013
http://www.duden.de/woerterbuch
Materials are given in form of photocopies if felt to be necessary

SPANISH – I

Course Code	Credit Units	Semester
FLS 101	02	1

Program Learning Outcomes :

- To produce global citizens speaking an International language in keeping with the institutional vision .
- To give students a platform to understand Culture and Society of a different world.
- To enhance the possibilities of jobs in MNCs established in/outside the country.
- To enhance the possibilities of Studying Abroad

Course Learning Objective:

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts .
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self introduction, family description etc.

After successful completion of the course, students will be able to express simple vocabulary in oral and writing. Students will be able to:

- Greet Formally and Informally
- Talk about gender, numbers and articles.
- Deal withbasicPhonetics
- Introduce oneself and others
- Talk about Professions and nationalities
- Count from 1 To 20
- Get introduced to Hispanic Culture

Course Contents:
Vocabulary: Passport Form, personal information, age, Interrogative pronouns, Alphabets, to be able to spell names, surnames, Good morning, good afternoon, Good bye Etc. different professions, countries, nationalities, languages.

Grammar:
Subject pronouns
Use of verbs SER/ESTAR/TENER in simple present tense
Use of regular AR /ER/IR ending verbs.
Llamarse y dedicarse
Simple Negativesenteses

Examination Scheme:

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					End Sem Evaluation (Total 50 Marks)
Quiz	**Mid Term Test**	**Presentation**	**Viva Voce**	**Attendance**	**End-Term Exam**
10	**15**	**10**	**10**	**5**	**50**

Text &References:

Nuevo Español Sin Fronteras (ESF1) by Jesús sánchez Lobato, Concha Moreno Garcia, Concha Moreno Garcia, Isabel Santos Gargallo, Sociedad General Española De Librería, S.A 2005

Pasaporte Nivel (A1) byMatideCerraloza Aragón, oscarCerraloza Gilli, Begoña Llovet Barquero, EdelsaGroup didascalia, S.A. 2005

Dictionaries for reference: Collins, www.wordreferences.com.

Essential materials are given in the form of photocopies.

CHINESE – I

Course Code	Credit Units	Semester
FLC 101	02	1

Program Learning Outcomes :

- To produce global citizens speaking an International language in keeping with the institutional vision .
- To give students a platform to understand Culture and Society of a different world.
- To enhance the possibilities of jobs in MNCs established in/outside the country.
- To enhance the possibilities of Studying Abroad

Aim: The Aims of Chinese language course at AUR is to equip students with the basic knowledge & skills in Chinese language so as to enable them to interact with Chinese speaking people and efficiently work in the Chinese environment and also to build a solid foundation for further studies in the language.

Course Learning Objectives:

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts .
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self introduction, family description etc.

On the completion of first semester the students will be able to:

- Understand the nature and characteristics of Chinese language.
- Read Chinese Pinyin and Chinese Characters.
- Write Chinese Characters and sentences related to greetings & personal information.
- Speak Chinese dialogues related to greetings & personal information.
- Listen and understand simple Chinese words and dialogues of the text.
- Manipulate basic grammatical structures.
- Master and use most essential vocabulary items of day to day use; approx 70 Characters including 50 characters of HSK level -I.
- Understand China as a powerful nation.

COURSE CONTENT

1. Introduction to Chinese Language
2. Introduction to the Sound System , Initials and Finals
3. Table of sounds of Beijing Dialect
4. Tones
5. Writing System & Basic Strokes of Chinese Character
6. Rules of Stroke-Order of Chinese Character,
7. Expression of Greetings & Good wishes
8. Farewell
9. Asking & telling Personal Information : Name & Age
10. Personal Information : Residence
11. Personal Information : Family Members

12. Listening Skill & Practice
13. Conversation based on dialogues
14. China; an emerging world power (In English)

VOCABULARY CONTENT

Vocabulary will have approx 70 Characters including 50 characters of HSK-I level.

1. Vocab related to greetings & farewell; 你， 好，再见。。。

2。Vocab related to personal information; 名字，年纪， 家， 住，爸爸。。

GRAMMATICAL CONTENT

1. Introduction to the sound system, initials and finals, sound table & tones.
2. Basic strokes of Chinese Character & stroke- order.
3. Conjunction 和.
4. Word order in Chinese sentence.
5. Adjective Predicate sentence.
6. 是 sentence type (1).
7. Interrogative sentence with 吗.
8. Attributive & structural particle 的.

EXAMINATION SCHEME

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					End Sem Evaluation (Total 50 Marks)
Quiz	**Mid Term Test**	**Presentation**	**Viva Voce**	**Attendance**	**End-Term Exam**
10	**15**	**10**	**10**	**5**	**50**

Text Books & References

1. Learn Chinese with me book-I (Major Text book), People's Education Press

2. Chinese Reader (HSK Based) book-I (suggested reading)

3. Elementary Chinese Reader Book-I (suggested reading)

DISCRETE MATHEMATICAL STRUCTURES WITH APPLICATIONS TO CS

Course Code	Credit Units	Semester
BCA 201	**03**	**2**

CLO1. Identify the basic principles of sets and operations in sets.
CLO2. Express a logic sentence in terms of predicates, quantifiers, and logical connectives.
CLO3. Discriminate, identify and prove the properties of groups and subgroups.
CLO4. Demonstrate an ability to use tree and graph algorithms to solve problem
CLO5. Develop the fundamentals and concepts of advantage and disadvantage of each measure and utility of appropriate measure under different circumstances.

Module I: Set Theory

Sets, Types of Sets, Basic Operations on Sets, Venn diagram, Cartesian product of two sets, Distributive law, De Morgan's Law.

Functions: Interval and sub-intervals. Definition of function and examples, polynomial, rational, exponential, logarithmic and trigonometric functions.

Module II: Mathematical Logic and circuits

Basic Concepts, Propositions or Statements, Truth Table, Connectives and Compound Propositions, Implication, Bi-conditional of Connectives, Converse, Inverse and Contra positive of an Implication, Tautology, Logical Equivalence, Switching Circuits

Module III: Modern Algebra

Binary Operations, Properties of Binary Operations, Semi group, Monoid, Groups, Finite and Infinite Groups, Algebra of Groups, Subgroups and other Groups.

Module IV: Graph Theory

Graph, Multi Graph, Complete Graph, Bi Graph, Degree, Degree Sequence, Matrices of graphs, tree, spanning trees

Module V: Data Analysis

Data and Statistical Data, Frequency Distribution, Graphical Representation, Measure of the Central Tendency, Measures of Dispersion (Mean Deviation and Standard Deviation)

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Elements of Discrete Mathematics: C.L. Liu
- Graph Theory: Wilson
- S.C Gupta & V.K. Kapoor, Fundamentals of Mathematical Statistics.

References:

- Discrete Mathematics: Harikishan &Shivraj Pundir
- Discrete Mathematics: J.K. Sharma.

INTRODUCTION TO SYSTEMS ANALYSIS & DESIGN

Course Code	Credit Units	Semester
BCI 202	**03**	**2**

CLO 1: Provides overview of the system development life cycle (SDLC) emphasizing analytical techniques to develop the correct definition of business problems and user requirements.
CLO 2: Investigate the feasibility assessment and develop system requirements for an assigned project. CLO5: Describe the role and responsibilities of the participants in information systems° development.
CLO 3: The student will be able to analyze business problems and develop a requirements° document, written in clear and concise business language.
CLO 4: Develop and present a Requirements Definition Proposal for a new system in a well-structured business proposal.

Course Contents:

Module I: System Concepts and the Information Systems Environment

What is System?, Important System Characteristic, Business Systems, Business, Information Systems, Categories of Information Systems, Transaction, Processing System, MIS, DSS, and Scope of Information system.

The Role of System Analyst: Overview of System Analysis and Design, Multifaceted role of System analyst: Analytical Skill, Technical Skills, and Interpersonal Skills.

Module II: System Development Life Cycle

The System Development Life Cycle, Structured Analysis Development Method, and Systems Prototype Method. System planning and Initial Investigation: System Planning: Information System Committee Method, User Group Committee Method, Initial Investigation, Feasibility Study: Operational, Technical and Economical Feasibility Cost Benefit Analysis: Data Analysis, Cost Benefit Analysis, The system proposal.

Module III: Determining System Requirements

Performing Requirements Determination, Traditional Method, Modern' Methods, and Radical Methods. The Tools of Structured Analysis: Process Modeling: DFD, Logical Modeling: Structured English, Decision Trees, and Data Modeling: ER Diagram

Module IV: Process and Stages of System Design

The process of design: logical design, physical design, Structured Design, Functional Decomposition, and Structured Walkthrough. Input/Output and Forms Design: Input design, output design, *forms* design, types of *forms,* layout considerations and *forms* control.

Module V: File organization and Database Design

File structure, file organization, -objectives of database, data structure, normalization, the role of database administrator. Automated Tools *for* Systems Development: CASE Tools

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- P-analysis & Design of Information Systems James A. Senn
- Modern System Analysis & Design: Jeffery A. Hoffer, Joey F. George, Joseph S. Valacich
- Elements of System Analysis & Design: Elias Awad.

DATA STRUCTURES USING C

Course Code	Credit Units	Semester
BCI 203	03	2

CLO1: Students will be able to use linear and non-linear data structures like stacks, queues , linked list etc.
CLO2: Define basic static and dynamic data structures and relevant standard algorithms for them: stack, queue, dynamically linked lists, trees, graphs, heap, priority queue, hash tables, sorting algorithms, min-max algorithm.
CLO3: Demonstrate advantages and disadvantages of specific algorithms and data structures,
CLO4: determine and demonstrate bugs in program, recognise needed basic operations with data structures
CLO5: Student will be able to choose appropriate data structure as applied to specified problem definition.
CLO6: Student will be able to handle operations like searching, insertion, deletion, traversing mechanism
CLO7: comprehend and select algorithm design approaches in a problem specific manner.
CLO8: Describe and apply advanced data structures and algorithms design techniques to solve computational problems.

Course Contents:

Module I: Basic concepts of data representation
Abstract data types: Fundamental and derived data types, Representation, Primitive Data Structures.

Module II: Arrays
Representation of arrays single and multi dimensional arrays. Address calculation using column and rows major ordering. Various operations on arrays, Vector, Application of arrays: matrix multi multiplication, sparse polynomial and addition.

Module III: Stacks and Queues
Representation of stacks and queues using arrays and linked list. Circular queues, priority queue and D-queue. Application of stacks: conversion from infix to postfix expression, Evaluation of postfix expression using stacks.

Module IV: Linked List
Singly linked list; operations on list. Linked stacks and queue. Polynomial representations and manipulation using linked lists, doubly linked list, addition of two polynomial list.

Module V: Trees
Binary trees traversal method: preorder, in-order, post-ordered traversal. Recursive and non-recursive algorithm for above mentioned Traversal methods. Representation of trees and its application: Binary tree representation of a tree, Binary search tree: height balanced (AVL) tree

Module VI: Searching, sorting and complexity
Searching: Sequential and binary search, indexed search, Sorting: insertion, selection, bubble, quick, merge, heap sort.

Module VII: Graphs
Graph representation: adjacency list, adjacency multicasts, adjacency lists. Traversal scheme: Depth first search, Breadth first search. Spanning tree: definition, minimal spanning tree algorithms.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- T. Langsam, M.J Augenstein and A.M. Tanenbaum, "Data structure using C and C++ Second edition, 2000, Prentice Hall of India.
- R.Kruse, G.L. Tonodo and B. Leung," Data structures and program design in C", Second Edition, 1997, Pearson education.
- S. Chottopadhayay, D. Ghoshdastidar & M. Chottopadhayay. Data structures through language", First edition, 2001, BPB Publication.

References:

- G.L. Heileman, Data structures, Algorithms and object oriented programming," First Edition 2002, Tata McGraw Hill.
- E. Horowitz, Sahni and D. Mehta," Fundamentals of data structures in C++,"200 Galgotia Publication

INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS

Course Code	Credit Units	Semester
BCI 204	**03**	**2**

CLO1: To investigate about what is database, different types of databases, and why they are valuable assets for decision making.
CLO2: Analyse the relational database model that takes a logical view of data.
CLO3: Investigate the relationships between entity and how such relationships are incorporated into the database design process.
CLO5: Develop normalization and ER modelling that are used concurrently to produce a good database design.
CLO6: Recognise the relationships among entities and the attributes of those entities, and in designing an entity relationship diagram to capture those relationships.
CLO7: Develop a set of queries to handle a specified set of typical user inquiries for information extraction from the database.

Course Contents:

Module I: Introduction to DBMS
Definition of DBMS, Data Independence, DBMS Architecture, Levels, Database Administrator, File System Approach Vs DBMS Approach, Advantages of Using a DBMS, Data Models , Schemas, and Instances.

Module II: Relational Database & ER Model
Relational System, Codd's Rule, Relational Model, Optimization, Tables and Views, Entity, Types of Entity, Weak Entity Attributes , Entity sets , Entity – Relationship Diagrams.

Module III: Relational Model Objects
Domains and Relations, Relations and predicates, Relational Data Integrity ; Primary Key, Candidate Key , Foreign Key and their rules; Relational operators, Relational Algebra, Relational Calculus, SQL Language, Data definition, Data retrieval and update operations.

Module IV: Database Design
Definition Of Functional Dependencies, Process Of Normalization, First Normal Form, Second Normal Form, Third Normal Form. Boycee Codd Normal Form, Fourth Normal Form, Fifth Normal Form.

Module V: Data Recovery & Protection
Recovery-Transaction recovery, System recovery, Media Recovery, Concurrency Control Techniques, Locking, Dead Lock, Serializability; Security - Introduction.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Elmasari, Navathe, "Fundamentals of Database Systems", Addision Wesley.
- Korth, Silbertz, Sudarshan, "Database Concepts". McGraw Hill.
- Majumdar & Bhattacharya, "Database Management System", Tata McGraw Hill.
- Date C J." An Introduction to Database Systems", Addision Wesley.

Data Structures using C LAB

Course Code	Credit Units	Semester
BCI 223	**01**	**2**

CLO1: Investigate different concepts of Data Structure in terms of application or project development.
CLO2: Create methods and programs within the field of procedural programming as well as developing logical and analytical approaches to programming problems independently.
CLO3: Apply his/her knowledge in new areas within field of basic and advanced programming.
CLO4: Develop independently relevant applications using self logic in the field of programming languages. These methods include performing experiment/programs and interpreting their results.

List of Data Structure Programs

1. Write a program to generate Fibonacci Series, using recursion.
2. Write a program to calculate Factorial of nth number, using recursion.
3. Write a program to implement Tower of Hanoi, using recursion.
4. Write a program to calculate GCD of two numbers, using recursion.
5. Write a program to calculate power of a number, using recursion.
6. Write a program to reverse a given string, using recursion.
7. Write a program to swap two elements without using third variable.
8. Write a program to remove all the duplicate elements present in the given array.
9. Write a program to search an element using Linear Search.
10. Write a program to search an element using Binary Search.
11. Write a program to sort the given array using Bubble Sort.
12. Write a program to sort the given array using Selection Sort.
13. Write a program to sort the given array using Insertion Sort.
14. Write a program to insert a new element in the given unsorted array at k^{th} position.
15. Write a program to insert a new element in the given sorted array at proper place.
16. Write a program to delete an element from given sorted array.
17. Write a program to merge to given sorted arrays.
18. Write a program to perform addition of two matrices.
19. Write a program to perform multiplication of two matrices.
20. Write a program to check whether given matrix is diagonal matrix, upper triangular matrix, lower triangular matrix.
21. Write a program to find out transpose of a given matrix.
22. Write a program using array of pointers, sort the given array of strings, using bubble sort.
23. Write a program to implement Stack using array, also show overflow and underflow in respective push and pop operations.
24. Write a program to implement Queue using array, which shows insertion and deletion operations.
25. Write a program to implement Circular Queue using array, which shows insertion and deletion operations.
26. Write a program to implement Linear Linked List, showing all the operations, like creation, display, insertion, deletion and searching.
27. Write a program to implement Stack, using Linked List. Implement Push, Pop and display operations.
28. Write a program to implement Queue, using Linked List. Implement Insertion, deletion and display operations.
29. Write a program to count the number of times an item is present in a linked list.
30. Write a program to increment the data part of every node present in a linked list by 10. Display the data both before incrimination and after.
31. Write a program to implement Doubly Linked List, showing all the operations, like creation, display, insertion, deletion and searching.
32. Write a program to create a Binary Search Tree and display its contents using preorder, postorder and inorder traversal.

33. Write a program to implement insert, delete and search operations in a Binary Search Tree

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

INTRODUCTION TO DATABASE MANAGEMENT SYSTEM LAB

Course Code	Credit Units	Semester
BCI 224	**01**	**2**

CLO1: Understand, appreciate and effectively explain the underlying concepts of database technologies
CLO2: Design and implement a database schema for a given problem-domain
CLO3: Populate and query a database using SQL DML/DDL commands.
CLO4: Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS
CLO5: Programming PL/SQL including stored procedures, stored functions, cursors, packages.

Course Contents:

Module I: Introduction to oracle

Tools of Oracle, Features of oracle.

1) Create a table "PRODUCTS" with the below mentioned structure:
   Product ID NUMBER(11)
   Supplier ID NUMBER(11)
   Category ID NUMBER(11)
   Quantity Per Unit VARCHAR2(20)
   Unit Price NUMBER(11)
   Units In Stock NUMBER(11)
   Units On Order NUMBER(11)
   Product ID should be the Primary Key.

Module II: SQL

Overview of SQL, Component of SQL (DDL, DML, DCL), Advantage of SQL, Basics of syntax writing, Data Definition Language, Create command, Data type, Constraints, ALTER & DROP, UPDATE & DELETE Commands, Substitutions variables, Run time Environments variables, SELECT Commands Basic Constructs, Functions, Nested Queries, Correlated queries, Views, Sequence, Synonymous, User Management Commands.

2) Consider the following tables:
   WORKS(Pname,Cname,Salary)
   LIVES(Pname,Street,City)
   LOCATED_IN(Cname,City)
   MANAGER(Pname,Mgername)

   Where Pname=Person name, Cname= Company name and Mgrname = Manager name.

   Write the SQL for the following:
   a) List the names of the people who work for the company Wipro along with the cities they live in.
   b) Find the people who work for the company "Infosys" with a salary more than Rs. 50000/-. List the names of the people , along with the street and city addresses.
   c) Find the names of the persons who live and work in the same city.
   d) Find the names of the persons who dod not work for "Infosys".
   e) Find the persons whose salaries are more than that of all of the "Oracle" employees.
   f) Find the names of the companies that are located in every city where the company "Infosys" is located.

3) Create table EMP and DEPT with the below mentioned structure
   Structure for EMP table

   EmpID NUMBER(4)

DeptID	VARCHAR2(10)
EmpName	CHAR(10)
Job	CHAR(10)
HireDate	DATE
Salary	NUMBER(7, 2)
Commission	NUMBER (7, 2)

Structure for DEPT table

DeptId	VARCHAR2(10)
Deptname	VARCHAR2(20)
No_of_Faculties	NUMBER(2)

In table EMP: EmpID should be the Primary Key and DeptID should be the foreign key.
In table DEPT: DeptId should be the primary key.

4) INSERT the following values in the EMP table:
   a) 1001,SET_01,Harrey,SE,01-Jan-2009,15000,3
   b) 1002,SET_02, Ron, SSE,15-Feb-1998,20000,4
   c) 1003,SEM_05, Peter, Manager,15-April-1999,40000,5
   d) 1002,SED_07, Jolie,Assistant Manager,15-Dec-1998,50000,5
   e) 1008,SET_08, Santy, SSE,15-Feb-2000,20000,4
   f) 1008,SED_10, San, SE,10-Feb-2009,22000,5

5) Considering the above table i.e EMP write the queries for the following:
   a) Find out the number of employees having "manager" as job.
   b) Display only the jobs with maximum salary greater than or equal to 3000
   c) Find all those employees whose job does not start with 'M'.
   d) Find the names of the employees whose name starts with 'S'.
   e) Find the names of the employees who are Managers and their date of joining is after "02-Jan-2006".
   f) For describing the structure of the EMP table and DEPT table.
   g) For getting the average salary of the employees from EMP table.
   h) For displaying the current date and give the column a name "DATE".
   i) For converting the name of the employee into uppercase where the employee name is "Santy"
   j) Create a sequence with name SEQ_EMP , which will generate numbers from 1 to 99 in ascending order with an interval of 1. The sequence must start from 1 after generating the number 99.
   k) Displaying the names of the employees who have an a and an e in their names.

6) Considering the table DEPT in question 3, find the total number of departments.

7) Alter the EMP table for the changing the width of the field EmpID from 4 to 10.

8) Alter the DEPT table for changing the width of the field No_of_Faculties from 2 to 4.

9) Delete all the records from the EMP table where the EmpName starts with "S",

10) Insert some values in the PRODUCTS table created in Question 1 and then DROP the table PRODUCTS.

11) Update the EMP table for the following values:
   a) Increase the salary of all the employees by 10% where the job is SE and SSE.
   b) Change the hiredate of the employee "Harry" to 01-Feb-2009.
   c) Update the salary of the employees to an increase of 15% where deptid is SED_07.

12) Alter the table EMP for the following:

a) Add one more field in the table i.e DOB DATE
b) Drop the column named Commission from the EMP table.

13) Write a query to select all the records from the EMP table.

14) Write a query to select all the records from the DEPT table.

15) Write a query to select the distinct deptid from EMP table.

16) Write a query to find the name and salary of the employee from EMP table where the salary is maximum.

17) Create a view amed v_EMP on the table EMP,DEPT by selecting the following fields

Emp ID, Dept ID, Emp Name, Job

Where the EMP.Dept ID = DEPT. Dept Id.

18) Create a synonym S_EMP on the table EMP.

Module III

Basic features, Block Structure of a PL/SQL Programs, Control Structures, Exception Handling, Cursor, Procedure, function and Triggers, Internet features of Oracle, Overviews of SQLJ

19) Write a PL/SQL program for:

a) Printing the Fibonacci series from 1 to 50.
b) Printing the smallest number among any three numbers.
c) Printing the table of any specific number entered.

20) Create a trigger named "Client_Master" which keeps track of records deleted or updated when such operations are carried out. Records in this table are inserted into table "Audit" when database trigger fires due to an update or delete statement fired on this table "Client".

Table: Client

Column name	***Data type***	***Size***
Client_no	Varchar2	6
Name	Varchar2	20
Address	Varchar2	30
Balance_Due	Number	10,2

21) Write a sql query to drop the table EMP, can we drop a table with data in it.

Examination Scheme:

IA				**EE**	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

Text & References:

- SQL, PL/SQL Ivan Bayross BPB Publication

DOMAIN ELECTIVE

NETWORKING FOR HOME & SMALL BUSINESS

Course Code	Credit Units	Semester
BCI 231	03	2

CLO 1: To understand basic terminology related to computer networks.
CLO 2: Identify different types of data transmission media used in both wired and wireless communications.
CLO 3: Define the use of different networking protocols.
CLO 4: Understand fundamental operating system concepts.
CLO 5: Understand fundamental security system concepts.

Course Contents:

Module I: Personal Computer Hardware
Personal Computers and Applications, types of Computers, Binary Representation of Data, Computer Components and Peripherals, Computer System Components

Module II: Operating System
Choosing the Operating Systems, Installing the Operating System, Maintaining the Operating System.

Module III: Connecting to the Networks
Introduction to Networking, Principals of Communication, Communicating on a Local Wired Network, Building the Access Layer of an Ethernet Network, Building the Distribution Layer of Network, Plan and Connect a Local Network

Module IV: Connecting to the Internet through ISP
The Internet and How We Connect To It Sending Information across the Internet
Networking Devices in a NOC Cables and Connectors Working with Twisted Pair Cabling

Module V: Network Addressing
Addresses and Subnet Masks, Types of IP Addresses, How IP Addresses are obtained
Address Management

Module VI: Network Services
Clients/Servers and Their Interactions, Application Protocols and Services, Layered Model and Protocols

Module VII: Wireless Technologies
Wireless Technology, Wireless LANs, Security Considerations on a Wireless LAN
Configuring an Integrated AP and Wireless Client

Module VIII: Basic Security
Networking Threats, Methods of attack, Security Policy, Using Firewalls

Module IX: Trouble Shooting your Network
Troubleshooting Process, Troubleshooting Issues, Common Issues, Troubleshooting and the Helpdesk

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- CCNA-Discovery 4.0, module 1, Cisco Certified Networking Academy

References:

- Data Communication and Computer Network, Forozoun, TMH Publication
- Data Communication and Network, Stallings, PHI
- Computer Network, Tanenbaum, PHI

INTERNET FUNDAMENTALS

Course Code	Credit Units	Semester
BCI 232	03	2

CLO 1: Understand the basics and underlying concepts of internet fundamentals.
CLO 2: Learn the basics of internet tools like email, online chat, scripting languages.
CLO 3: Create awareness about the installation and use of web servers and security & privacy issues of internet.

Course Contents:

Module 1: Internet Basics

Introduction to Internet, History of Internet, Internet Working, Modes of Connecting to Internet, Internet Service Providers(ISPs), Differentiate between Internet, Intranet and Extranet, Protocol, Internet address, IP addressing, standard address, domain name, DNS, internet tool, TCP/IP and UDP, OSI reference model.

Module 2: Electronic Mail

Introduction to E-mail, advantages and disadvantages of e-mails, structure of an e-mail address, message components, message composition, mailer features, Internal working of E-mail, E-mail management, MIME types, Newsgroups, mailing lists, chat rooms, secure-mails, SMTP,POP, PICO, Pine, Gopher.

Module 3: World Wide Web

Introduction to www, Miscellaneous Web Browser details, searching www: Search engines and meta search engines, search fundamentals, search strategies, working of search engines, Telnet, FTP, HTTP, Introduction to Browser, Coast-to-coast surfing, HTML, Web page installation and setup , Basics of HTML, formatting & hyperlink creation. Using and installing Plug-ins.

Module 4: Introduction to Languages and Servers

Basics of java script language, Client/Server Side Programming in java script, Using Forms and data entry using java script, XML and DHTML basics, Creating Static and dynamic web pages. Web Servers: PWS, IIS, Apache, Advantages and limitations of using these servers.

Module 5: Privacy and security

Introduction to security over internet,Network Attacks, security and privacy levels, security policy, virus worms andd Trozan horses, Cryptography: Encryptionand Decryption techniques, SecureWeb document, Digital Signatures, Firewalls and its types, IDS.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Fundamentals of the Internet and the World Wide Web, Raymond Greenlaw and Ellen Hepp – 2001, TMH
- Internet & World Wide Programming, Deitel,Deitel & Nieto, 2000, Pearson Education

References:

- Complete idiots guide to java script,. Aron Weiss, QUE, 1997
- Atul Kahate, “Cryptography and Network Security”, Tata McGraw-Hill, 2003

CYBER SECURITY

Course Code	Credit Units	Semester
BCI 233	**03**	**2**

CLO 1: Analyze and resolve security issues in networks and computer systems to secure an IT infrastructure.
CLO 2: Design, develop, test and evaluate secure software.
CLO 3: Develop policies and procedures to manage enterprise security risks.

Course Contents:

Module I: Introduction to Cyber Security
Introduction to Cyber Security, Cyber Crime / Social Theories, Threats to security, Government requirements, Information Protection and Access Controls, Computer security efforts, Standards, Computer Security mandates and legislation, Privacy considerations, International security activity, Intrusion Detection , Malicious Software Use and Detection

Module II: Information Technology Law
The Information Technology Legal Framework in India, Cyber Crime, Digital Evidence, Technological Standards under the Information Technology Law, Liability of companies under the Information Technology Act

Module III: Network Security
Intrusion Detection & Prevention systems, Firewalls and Firewall Policy, Computer Security Log Management, Securing WiMAX Wireless Communications

Module IV: Information security
Fundamentals, Employee responsibilities, information classification, Information handling, Tools of information security, Information processing, secure program, administration.

Module V: Information Technology Act Compliance
IT Act compliance for e-Commerce Sector, Education Sector, Healthcare Sector, Hospitality Sector, Outsourcing Sector, Retail Sector

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text Book:

- Rick Lehtinen and G.T. Gangemi, Computer Security Basics, 2nd ed. (2006), O'Reilly Media Inc.

Reference Book:

- McClure, Stuart & Scambray, Joel, Hacking Exposed 5th ed. et al (2005),, McGraw-Hill Osborne Media.
- Ortmeier, P. J., Security Management: An Introduction, 2nd ed. (2005), Prentice Hall.

ANANDAM-II

Course Code	Credit Units	Semester
AND002	02	2

Course Learning Outcomes:

The student should develop:

- Awareness and empathy regarding community issues
- Interaction with the community and impact on society
- Interaction with mentor and development of Student teacher relationship
- Interaction among students, enlarge social network
- Cooperative and Communication skills and leadership qualities
- Critical thinking, Confidence and Efficiency

Course Objectives:

After the completion of this course, students will be able to:

- apply their knowledge and skills to solve specific community problem
- learn to plan, lead, and organize community events have a sense of belonging to their college campus and community and find something they are interested in doing during their free time
- make new friends, expand social network, and boost social skills and mental health.
- be useful to society as it will protect them against stress, frustration, and depression

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants, phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.

- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.
3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
6. For the topic chosen by the group, students are recommended to cover the following points:
    a) Current scenario (Regional, national and international level as applicable)
    b) Future predictions
    c) Duty of the government
    d) Government policies (related to the topic), if any
    e) Duty of public
    f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.

Conclusion is clearly stated. The underlying logic is explicit.

ENGLISH

Course Code	Credit Units	Semester
BCS 201	01	2

A. COURSE LEARNING OUTCOMES (CLO)

CLO 1	Participate in conversation and in small- and whole-group discussion
CLO 2	Explore and use English as medium of communication in real life situation
CLO 3	Discuss topics and themes of a reading, using the vocabulary and grammar of the lesson
CLO 4	Identify features of a reading textbook and utilize them as needed
CLO 5	Prepare and deliver organized presentations in small groups and to whole class
CLO 6	Apply sentence mechanics and master spelling of high frequency words

B. SYLLABUS

Developing Listening Skills
Developing Speaking Skills
Developing Reading Skills
Developing Writing Skills
Principles of Good Writing - L Hill
Toasted English -R. K. Narayan
On Saying Please- A G Gardiner
All the World's a Stage : Shakespeare
Where the Mind is without Fear: R N Tagore
O Captain, My Captain: W. Whitman
Psalm of Life: H. Longfellow
Go Kiss the World by Subroto Bagchi; Steve Jobs By Walter Isaacson; Rich Dad, Poor Dad by Robert Kiyosaki; The Road Ahead by Bill Gates; What You See, Is What You Get By Alan Sugar (Non detailed study; any of books)

EXAMINATION SCHEME:

Components	CT/Mid-term	Project/Presentation/ Assignment/Viva	Book Review	Quiz	Attendance	EE
Weightage (%)	15	10	10	10	5	50

SUGGESTED READINGS

Bhardwaj, Ashu. *A Course Book of English & Communication Skills*. Paragon: New Delhi,2011.

Farhanthullah, T M. *Communication Skills for Technical Students*. Orient Black PVT: 2008.

Jha, Madhulika. *Echoes.* Orient Blackswan: New Delhi, 2007.

Koneru, Aruna. *Professional Communication.* The McGraw Hill: New Delhi, 2008.

Prasad, Dr P. *The Functional Aspects of Communication Skills*.SK & Sons: New Delhi, 2003.

Raman, Meenakshi and Sangeeta Sharma, *Technical Communication: Principles and Practice.* OUP: New Delhi, 2004.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Madhulika Jha, Echoes, Orient Long Man
- Ramon & Prakash, Business Communication, Oxford.
- Sydney Greenbaum Oxford English Grammar, Oxford.
- Successful Communications, Malra Treece (Allyn and Bacon)
- Effective Technical Communication, M. Ashraf Rizvi.

BEHAVIOURAL SCIENCE – II
(PROBLEM SOLVING AND CREATIVE THINKING)

Course Code	Credit Units	Semester
BSS 203	01	2

Course learning outcomes (CLOs)

At the successful completion of this course you (the student) would be able to:

1. Recognize the relation critical thinking with various mental processes.
2. Identify hindrance to problem solving processes.
3. Analyze the steps in problem-solving process.
4. Create plan of action applying creative thinking.

Course Objective:

- To enable the students:
- Understand the process of problem solving and creative thinking.
- Facilitation and enhancement of skills required for decision-making.

Course Contents:

Module I: Thinking as a tool for Problem Solving

What is thinking: The Mind/Brain/Behaviour

Thinking skills
Critical Thinking and Learning:
Making Predictions and Reasoning
Memory and Critical Thinking
Emotions and Critical Thinking

Module II: Hindrances to Problem Solving

Perception
Expression
Emotion
Intellect
Work environment

Module III: Problem Solving Process

Recognizing and Defining a problem
Analyzing the problem (potential causes)
Developing possible alternatives
Evaluating Solutions
Resolution of problem
Implementation

Module IV: Plan of Action

Construction of POA
Monitoring
Reviewing and analyzing the outcome

Module V: Creative Thinking

Definition and meaning of creativity
The nature of creative thinking
Convergent and Divergent thinking
Idea generation and evaluation (Brain Storming)
Image generation and evaluation

Debating
The six-phase model of Creative Thinking: ICEDIP model

Examination Scheme:

Components	SAP	JOS	FC/MA/CS/HA	P/V/Q	A
Weightage (%)	25	15	30	25	05

SAP- Social Awareness Programme; **JOS**-Journal of Success; **HA**-Home Assignment; **P**-Presentation; **V**-Viva; **Q**-Quiz; **FC-** Flip class; **MA-** Movie Analysis; **CS-** Case study; **A**-Attendance

Text & References:

- Michael Steven: How to be a better problem solver, Kogan Page, New Delhi, 1999
- Geoff Petty: How to be better at creativity; Kogan Page, New Delhi, 1999
- Phil Lowe Koge Page: Creativity and Problem Solving, New Delhi, 1996
- Bensley, Alan D.: Critical Thinking in Psychology – A Unified Skills Approach, (1998), Brooks/Cole Publishing Company.

FRENCH - II

Course Code	Credit Units	Semester
FLT 201	02	2

Course Learning Objective:

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts .
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self introduction, family description etc

- To speak about the activities and hobbies
- To express ones tastes
- To excuse oneself
- To understand a mail
- To ask ones way
- To indicate the direction
- To express a wish
- To ask for information
- To give an order or a suggestion
- To read a plan of metro and RER.

Course Contents:

Unité 1 (Leçon 4) and Unité 2 Université et les grandes écoles : 18-39 Leçons 4, 5 & 6.

Contenu Lexical:

1. Les loisirs
2. Les saisons
3. Les nombres
4. Le logement et la ville
5. Les prépositions de lieu
6. Les verbes de direction
7. Les lieux de l'université
8. Les documents administratifs
9. Les expressions utiliseés en classe par le professeur
10. Quelquesraccourcis: diminutis et sigles

Contenu Grammatical:

1. Aimer, faire et savoir au present
2. La negation
3. Les adjectifs possessives au pluriel
4. Le partitifs
5. Aller au présent
6. <<il y a>>

7. L'usage des prepositions de lieu
8. Vouloir et pouvoir au présent
9. L'impératif
10. Le conditionnel de politesse

EXAMINATION SCHEME

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					End Sem Evaluation (Total 50 Marks)
Quiz	**Mid Term Test**	**Presentation**	**Viva Voce**	**Attendance**	**End-Term Exam**
10	**15**	**10**	**10**	**5**	**50**

Text & References:

- Le Gargasson, I. Naik, S. Chaize, C. (2012) Tech French, Delhi : Goyal Publications
- Ray. A, Robert (2010) Le Petit Robert French Dicitionary, Paris: Le Robert
- Robert, Collins (2006) Collins Robert French Dictionary, Paris : Harper Collins

GERMAN – II

Course Code	Credit Units	Semester
FLG 201	02	2

Course Learning Objective:

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts .
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self introduction, family description etc.

After successful completion of this semester, students will be able to:

- Recognizing geographical locations.
- Know famous places in Germany and Europe.
- To be able to form basic questions
- use of past participle of verb was/were and make sentences.
- able to conjugate irregular verbs
- use possessive article for the nominative case
- Use of adjectives in sentences.
- They can describe their house like number of bedroom, kitchen etc
-

Course Content:

Vocabulary

- Verb was/were
- Types of Houses and Apartments,
- State and cities
- directions like north, south etc.,
- Neighboring countries of Germany and their respective languages.
- Description of house: Bedroom, bathroom, kitchen etc.

Grammar:

- Interrogatives – what, which, why, how, who, when
- Yes - no question
- Introduction of irregular verbs
- Article in accusative (definite and indefinite)
- Possessive article

EXAMINATION SCHEME

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					End Sem Evaluation (Total 50 Marks)
Quiz	**Mid Term Test**	**Presentation**	**Viva Voce**	**Attendance**	**End-Term Exam**
10	**15**	**10**	**10**	**5**	**50**

Prescribed Text-Book: Lesson 11 onwardsfromDeutschalsFremdsprache -1A, IBH & Oxford, New Delhi, 1977

References: **Studio D A1** by Hermann Funk, Christina Kuhn and Silke Demme, Cornelsen, 2013
Tangram A1by Rosa Maria Dallapiazza, Eduard von Jan & Till Schoenherr, Max Hueber, 2007
SprachtrainingA1 by Rita Maria Niemann, Dong Ha Kim, Cornelsen, 2013

Dictionaries for reference: **Studio D: Glossar** A1 - Deutsch –Englisch, Cornelsen, 2013
http://www.duden.de/woerterbuch

Materials are given in form of photocopies if felt to be necessary

SPANISH – II

Course Code	Credit Units	Semester
FLS 201	02	2

Course Learning Objective:

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts .
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self introduction, family description etc.
- To enhance all five skills of the language: Reading, Writing, Listening, Interacting and speaking.
- Adjectives to describe people
- To talk about locations and places.
- To be able to form basic questions
- Counting till 100
- To be able to speak about daily Routine and verbs of daily usage both regular & irregular verbs.

Course Content:

Vocabulary:

Home, Classroom, Neighborhood, hotel, Restaurant, Market, Days name, Months name, Colors names etc. Interrogatives.

Grammar:

Use of SER/ESTAR/TENER/ HAY
Difference between Estar and Hay
Demonstrative pronouns
Interrogatives – what, which, why, how, who, when
Introduction of irregular verbs
Possessive pronouns

Examination Scheme:

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					End Sem Evaluation (Total 50 Marks)
Quiz	**Mid Term Test**	**Presentation**	**Viva Voce**	**Attendance**	**End-Term Exam**
10	**15**	**10**	**10**	**5**	**50**

Skills Evaluated: Writing, Comprehension, grammar, and Vocabulary

Text &References:

Nuevo Español Sin Fronteras (ESF1) by Jesús sánchez Lobato, Concha Moreno Garcia, Concha Moreno Garcia, Isabel Santos Gargallo, Sociedad General Española De Librería, S.A 2005
Pasaporte Nivel (A1) byMatideCerraloza Aragón, oscarCerraloza Gilli, Begoña Llovet Barquero, EdelsaGroup didascalia, S.A. 2005

Dictionaries for reference: Collins, www.wordreferences.com.

Essential materials are given in the form of photocopies.

CHINESE – II

Course Code	Credit Units	Semester
FLC 201	02	2

Course Learning Objectives:

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts.
- Students will be able to communicate in small sentences in writing, self-introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self-introduction, family description etc.

On the completion of second semester the students will be able to:

- Read Chinese words, phrases and simple sentences both in Pin Yin and Characters.
- Write Chinese Characters and sentences.
- Speak Chinese dialogues with correct pronunciation & tone.
- Listen and understand simple Chinese words and dialogues used in syllabi.
- Manipulate basic grammatical structures such as questions type (2), 有 sentence, verbal predicate, 们， numeration, time etc.
- Master and use most essential vocabulary items of day-to-day use; approx. 110 Characters including 50 characters of HSK level -I.
- Understand Sino-Indian Relations.
-

COURSE CONTENT

1. Personal information: hobbies & habits
2. Personal information: abilities
3. Expression of gratitude
4. Expression of apology
5. Numbers & currencies
6. Expression of time
7. Description of weather
8. Description of direction,
9. Listening of dialogues
10. Conversation based on dialogues
11. Chinese CBT package /video clipping
12. Sino-Indian relations (in English)

VOCABULARY CONTENT

Vocabulary will include approx 110 Characters including 50 Characters of HSK-I level.

1. Vocab related to hobbies, abilities, gratitude, apology numbers, time, weather, direction, etc will be covered.

GRAMMAR CONTENT

1. Question of type (2) & (3)

2. 有 sentence
3. Auxiliary verbs:要,会,能, 可以
3. The sentence with a verb as its predicate.
4. 们: a plural suffix
5. Numeration
6. Interrogative pronoun 多少
7. Counting Money
8. A numeral-measure word as the attributive
9. Time words: Time, month, day & date
10. The demonstrative pronoun as the attributive
11. The adverbial adjunct:
12. Words of location

EXAMINATION SCHEME

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					**End Sem Evaluation (Total 50 Marks)**
Quiz	**Mid Term Test**	**Presentation**	**Viva Voce**	**Attendance**	**End-Term Exam**
10	**15**	**10**	**10**	**5**	**50**

Textbooks & References

1. Learn Chinese with me book-I (Major Textbook), People's Education Press

2. Elementary Chinese Reader Book-I (suggested reading)

2. Chinese Reader (HSK Based) book-I (suggested reading)

3. Practical Chinese Grammar for foreigners (suggested reading)

COMPUTER ORIENTED STATISTICAL AND OPTIMIZATION METHODS

Course Code	Credit Units	Semester
BCA 301	**03**	**3**

CLO 1: Develop the fundamentals and concepts of advantage and disadvantage of each measure and utility of appropriate measure under different circumstances.
CLO 2: How to apply discrete and continuous probability distributions to various business problems.
CLO 3: Formulation of optimization models and use the various optimization methods to fulfill the demand allocation under different scenarios.
CLO 4: Examine the description of an engineering design problem to assess whether the solution may be facilitated by an optimization method.
CLO 5: Determine mathematically and logically the actions that "players" would take to secure the best outcomes for themselves in a wide array of "games".

Course Contents:

Module I

Collection of Data, Sampling and Sampling Designs, Classification and Tabulation of Data, Graphical representation of Data, Measures of Central Value, Measures of Dispersion. Moments, Skewness, Kurtosis, Correlation and Regression.

Module II: Probability

Classical Definition of Probability,Algebra of Events, Probability Axoims, Conditional Probability.
Probability Distributions: Discrete and Continuous Distributions, Binomial Distribution, Poisson distribution, Normal Distribution.

Module III: Linear Programming

Mathematical Formulation of Linear Programming models and its Graphical Solutions, Simplex Method, Charne's Big M method, Two Phase Method.

Module IV: Transportation Problem

General Transportation model, Starting basic Solutions:-North west Corner Method, Least Cost Method, Vogel's Approximation Method, Test of optimality, unbalanced Problem.

Assignment Problems

Module V: Game Theory

Two-Person Zero Sum Games, Maximin-Minimax Principal, Pure Strategies, Mixed Strategies, Expected Pay off, Concept of Dominence, Graphical Solution of m X 2 and 2 X n Games.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- P.K. Gupta & Manmohan, Linear Programming and Theory of Games.
- S.C Gupta & V.K. Kapoor, Fundamentals of Mathematical Statistics.

References:

- Hogg, Probability and Statistical Inference.
- Alexander. M. Mood, Introduction to the Theory of Statistics
- Franklin. A. Graybill, Dane. C. Boes
- Taha, Handy A, Operations Research
- G. Hadley, Linear Programming.

ADVANCE DATABASE MANAGEMENT SYSTEMS

Course Code	Credit Units	Semester
BCA 302	**03**	**3**

CLO 1: To analyse the basics of SQL and construct queries using Pl/SQL efficiently and apply object oriented features for developing database.
CLO 2: To understand the trigger and stored procedure in database which automatically invokes whenever a special event in the database occurs.
CLO 3: Recognise the distributed DBMS which provide other functions including integration of heterogeneous data, query optimization and processing, concurrency control and recovery.
CLO 4: Understand the parallel database for solving the problem by splitting database operations into separate tasks.
CLO 5: Analyse the Object Oriented (OO) Data Model in DBMS for solving the complex real-world problems and demonstrate the need of a data model that more closely represented the real world.

Course Contents

Module I Design Theory for Relational Database
Functional Dependencies, Decomposition of Relation Schemes, Normal Forms for Relations, Schemes, Multivalued and other kinds of Dependencies, Transactions and Concurrency Control.

Module -II: Basics of PL/SQL
PL/SQL basics, blocks, architecture, variables, constants, attributes, character set, JOIN and its types with queries, data types, control structure, conditional and sequential control statements.

Module -III: Advanced PL/SQL
PL/SQL precompiler, cursors, type of cursors, exceptions, Indexing, View, triggers, PL/SQL Stored procedures and packages00

Module IV Query Optimization and Database Protection
Basic Optimization Strategies, Algebraic Manipulation, Optimization of Selections in System, Exact Optimization for a Subset of Relational Queries, Optimization under Weak Equivalence. Integrity, Constraints in Query-by-Example, Security, Security in Query-by- Example, Security in Statistical Databases.

Module V Object and Object Relational Databases
Concepts for Object Databases, Object Identity, Object structure, Type Constructors, Encapsulation of Operations, Methods, Persistence, Type and Class Hierarchies, Inheritance, Complex Objects, Object Database Standards, Languages and Design: ODMG Model – ODL – OQL – Object Relational and Extended – Relational Systems, Object Relational features in SQL/Oracle – Case Studies.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text Books:

1. J.D.Ullman- Principles of Database Systems, Galgotia, New Delhi.
2. S.Ceri and G. Relagatti- Distributed Databases, McGraw-Hill.

Reference Books:

1. M.T.Ozsu & P.Valduriez-Principles of Distributed Database Systems, 2nd Edn, Pearson Education.
2. Elmasri & Navathe- Fundamentals of Database Systems, 3rd Edn, Pearson Education.

OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++

Course Code	Credit Units	Semester
BCI 303	**03**	**3**

CLO 1: Investigate different concepts of programming approaches in terms of the application or project development.
CLO 2: Create methods and programs within the field of procedural programming as well as developing logical and analytical approaches to programming problems independently.
CLO3: Apply his/her knowledge in new areas within the field of basic and advanced programming.
CLO 4: Develop independently relevant applications using self logic in the field of programming languages. These methods include performing experiments/programs and interpreting their results.

Course Contents:

Module I: Overview of C++

What is Object Oriented Programming, Characteristics of OOP, Difference between C and C++.
Basics:-Input/Output in C++ using cin/cout, Preprocessor Directives, Data Types-Integer, Float, character, Enumerated data types, library functions, comments, storage classes, manipulators, type conversion, arithmetic operators, arrays and strings

Module II: Loops and Decisions

Relational operators, Logical operators, Decisions-if, if-else and switch. Loops-for, while, do-while and nested loops, precedence summary, break, continue and goto statements.
Functions: Simple functions, passing arguments to functions, returning values from functions, reference arguments, returning by reference, Overloaded functions, Inline functions

Module III: Structures

A simple Structure, specifying the Structure, defining the structure variable, assessing members of structure, structure within structure, assessing structure members using pointers
Classes and objects: A simple class, C++ objects as physical objects, Constructors, Destructors, objects as function arguments, returning objects from functions, static class data, array as class data member, array of objects.

Module IV: Operator Overloading & Inheritance

Overloading unary operator, Overloading binary operator, data conversion. Inheritance: Derived and Base class, Derived class Constructor, types of Inheritance , Abstract base class , public and private Inheritance, level of Inheritance, Ambiguity in multiple inheritance .

Module V: Pointers and Virtual functions

Pointers and Arrays, pointers and strings, pointers and functions, pointers to objects, virtual functions, friend functions, static functions, this pointer.
Files and Streams: streams, string I/O, character I/O, object I/O, file pointer, error handling, command line arguments.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Programming with C++, Ravi Chandran
- Mastering C++, Venugopal
- Programming in C++, SCHAUM's series
- The complete reference C++, Herbert Schildt
- Turbo C++, Robert Lafore

ADVANCE DATABASE MANAGEMENT SYSTEMS LAB

Course Code	Credit Units	Semester
BCA 322	01	3

CLO 1: After completion of this course, student will be able to identify advance database concepts and database models. CLO 2: Apply and analyze various terms related to transaction management in centralized and distributed database. CLO 3: Produce data modeling and database development process for object –oriented DBMS.

INSTRUCTIONS TO STUDENTS

1.Students should be regular and come prepared for the lab practice.

2. In case a student misses a class, it is his/her responsibility to complete that missed experiment(s).

3. Students should bring the observation book, lab journal and lab manual. Prescribed textbook and class notes can be kept ready for reference if required.

4. They should implement the given experiment individually.

5. While conducting the experiments students should see that their programs would meet the following criteria:

- Programs should be interactive with appropriate prompt messages, error messages if any, and descriptive messages for outputs.
- Programs should perform input validation (Data type, range error, etc.) and give appropriate error messages and suggest corrective actions.
- Comments should be used to give the statement of the problem and every function should indicate the purpose of the function, inputs and outputs
- Statements within the program should be properly indented
- Use meaningful names for variables and functions.
- Make use of Constants and type definitions wherever needed.

6. Once the experiment(s) get executed, they should show the program and results to the instructors and copy the same in their observation book.

7. Questions for lab tests and exam need not necessarily be limited to the questions in the manual, but could involve some variations and / or combinations of the questions.

LAB CONTENTS

SL NO. TITLE OF EXPERIMENT WEEKS

1. SQL BASICS 2 weeks
2. Analyzing given system and preparing ERmodel and converting it to relational schema. 1 week
3. SQL Advanced Commands 2 weeks

4. PL/SQL BASICS & Cursor
   1 week
5. Cursors continued & exception handling 1 week
6. Triggers 1 week
7. Procedures, Functions, Packages 2 weeks
8. Interfacing DB with any latest front end 1 week
9. Implementation 1 week

LIST OF PROGRAMS

1. Week 1 SQL

1.1 Create table EMP with following columns and constraintsNote:

Note: Give descriptive enough name to the constraints

Name	Type	Constraint
EMPNO	NUMBER(4)	Make this as primary key after creating table
ENAME	VARCHAR2(10)	
JOB	VARCHAR2(9)	CLRK/MGR/A.MGR/GM/CEO, default CLRK
MGR_ID	NUMBER(4)	References EMP
DATE_BIRTH	DATE	Must be less than joining Date
SAL	NUMBER(7,2)	More than 20000,default 20001
COMM	NUMBER(7,2)	DEFAULT 1000
DEPTNO	VARCHAR2(3)	References DEPT
DATE_OF_JOIN	DATE	

Add a primary key constraint to EMP table after creating the table

1.2 Create table DEPT with following columns and constraints

Name	Type	Constraint
DNO	VARCHAR2(3)	Primary Key and Starts from 'D'
DNAME	VARCHAR2(10)	Unique
LOCATION	VARCHAR2(9)	BNG/MNG/MUB/HYD/CHN, default BNG

1.3 Create table PROJECTs with following constraints

Combination of DNO and PRJ_NO is primary key

Name	Type	Constraint
DNO	VARCHAR2(3)	References DEPT ,NOT NULL
PRJ_NO	VARCHAR2(5)	Starts from 'P' , NOT NULL
PRJ_NAME	VARCHAR2(10)	
PRJ_CREDITS	NUMBER(2)	Range from 1 to 10
STRT_DATE	DATE	
END_DATE	DATE	END_DATE > START_DATE

Add a column to EMP table named PRJ_ID. Add a foreign key constraint to EMP table on (DeptNo,Proj_Id) referencing PROJECTS. Indicates -an employee from which department is working on which project/s.

1.4 Insert records into EMP table

In the following records take any valid values to the columns left blank, columns with null must be entered with null values only

Empno	Ename	Job	MgR_ID	Date_ofBirth	Sal	comm	Deptno	Prj_Id	Dateof join
100	Ravi	MGR	111	10-10-1985	32000		D1	P1	2-10-2001
102	Raviraj	CLRK	100	10-12-1980	24000		D1	P3	12-11-2000
111	Raghu	GM	150	10-12-1974	45000	15000	null	null	3-12-1985
150		CEO	null	10-12-1970	60000	30000	null	null	3-12-1990
103		A.CLRK	111	10-12-1980			D1	P1	2-10-2001
103		CLRK	111	2-10-1980			D1	P3	2-10-2002
125	Manu	A.MGR	150	10-12-1980			D4	P2	2-10-2002
104		CLERK	100	2-10-1980			D2	P1	2-10-2005
106		MGR	100	2-10-1986			D2		2-10-1985
123	Mahesh	CLRK	106	10-12-1974	25000		D3	P2	2-10-2002
108		CLRK	106	10-12-1970			D9		2-10-1985
103		CLRK	111	10-12-1980			D1	P3	2-10-2001
null		CLRK	106	10-12-1980	18000				10-12-1980

1.5 Insert records into DEPT table

DNO	DName	Location
D1	Marketing	CHN
D2	Research	MNG
D3	Administrator	BNG
D4		BGG
D5	IT	BNG
Null	Corporate	HYD

Write the reason if some records are not inserted. Insert your own 2 records

1.6 Insert records into PROJECTS

Dno	Prj_No	Prj_Name	Prj_Credits
D1	P1		2
D2	P1		2
D3	P2		7
D1	P3		5
D4	P2		7

Insert your own 2 records

2. Week 2

2.1 Display all records from EMP,DEPT and PROJECTS table

2.2 Display records of Employees who have salary more than 25000 or working in department D2

2.3 Delete employee records working on project P2 and confirm the result. Type ROLLBACK to restore records back if records are deleted.

2.4 Delete department Marketing from DEPT table, confirm the result with reason. Type ROLLBACK to restore records back if records are deleted.

2.5 Delete records of employees working under Manger with ID 100 and in project P1.

2.6 Update the DNO of first record in PROJECTS to D5, confirm the result with reason.

2.7 Update the Job of employee with EmpNo 123 to MGR, salary to 35000 and his manager as 111.

2.8 List all employee names and their salaries, whose salary lies between 25200/- and 35200/- both inclusive.

2.9 List all employee names reporting to employees 100,125,150

2.10 List all employees whose name starts with either M or R.

2.11 List the name of employees whose name do not starts with M.

2.12 List all kind jobs available in employee table, avoid displaying duplicates.

2.13 List minimum, maximum, average salaries in company.

2.14 Display the number of employees working in each project.

2.15 List the Employees name and their manager's names

2.16 List Employees Name, their department name and Projects Name in which they are working.

2.17 List the employee names, salary of employees whose first character of name is R, 2nd and 3rd characters are 'v','i' and remaining characters are unknown.

3. Week 3

3.1 List the Projects name undertaken by Marketing Department.

3.2 Display current date, 53, absolute value of -45 and current date as date with format MONTH-YY.

3.3 Display the employees name and salary in descending order by salary.

3.4 List the name of departments which are working with more than 1 project

3.5 Display department name, Max salary and Min salary in each department.

3.6 List the employees whose experience is more than 5 years.

3.7 List the Employees number, Name and their Age and retirement date(assume 60 years retirement age).

3.8 List the Employees who born on December month.

3.9 List the Employees names who born on a given year.

3.10 List the Employees names who joined on day 12.

3.11 List the Employees names having service experience more than 10 years.

3.12 List the projects which have duration more than 1 year.

3.13 List the Employees Name who is working at Locations (BNG,MUB,HYD)7

3.14 Update the COMM column of EMP table based on the SAL. Use COMM=CMM+SAL*10/100

3.15 List employee names, padded to right with a series of three periods and space up to a width of 30, and project credits of projects in which they are working.(Use RPAD,LPAD)

3.16 List the name of employees who are working in project with credit more than 7 and display name with only first letter capital and replace the character 'a'(if present) in the name by '$'.

3.17 Display department Name and Total amount spent on each department by the company as Salary.

3.18 List Employee numbers, SAL *12 (rename as ANNUAL_SAL), SAL*12 *0.1 (as TAX) , display ANNUAL_SAL and TAX in the format of $12,34,456.90.

4. Week 4

Analyzing the given system and designing ER –Model and converting the ER-model to relational scheme and implementing in Oracle. Listing the functionalities to be implemented and designing application logic(pseudo code) for the functionalities.

5. Week 5

5.1 List Job category and total salary paid for the each jobs category by the company

5.2 Display name of the department from which maximum number of employees are working on project P1

5.3 Display department names and number of CLRK working in the departments.

5.4 Display Employee names who are not working in any of the projects.

5.5 Create a View EMP_PRJ_VW to display records of employees of ‘marketing’ department and project in which they are working.

5.6 Display employee names and projects in which they are working using ViewEMP_PRJ_VW

5.7 Insert a record into View EMP_PRJ_VW and check the underlying tables for result and confirm result with reason.

5.8 Create an unique index on the column name DNAME on DEPT table

5.9 Create an index on the columns (name and job) on EMP table.

5.10 Create a Sequence STUD_SEQ which starts from 100 to 999 with increments

of 3.

5.11 Create a table STUD with columns ROLLNO and Name. Insert ROLLNO values by

taking values from STUD_SEQ.

5.12 Display Location of department and Employees name working in Marketing

department or Research (using set operator).

5.13 Display the names of the Departments undertaking both projects P1 and P3 (using

set operator).

8

6. Week 6 - PL/SQL

6.1 Write a PL/SQL block to insert row into EMP table.

6.2 Write a PL/SQL block for performing money withdrawal operation. Assume that the account has to maintain minimum 2000/- always. Assume current balance is 5000/- display the message- 'WITHDRAWAL COMPLETED' if new balance after withdrawal is >= 2000 otherwise 'WITHDRAWAL NOT COMPLETED'

6.3 Write a PL/SQL block to check an input string is palindrome or not palindrome.

6.4 Write a PL/SQL block to reverse a given number.

6.5 Write a PL/SQL block to accept employee number and display Employee Name, salary of employees in the format – 'RAVI draws 32000/- as salary'

6.6 *Write a PL/SQL block to input employee number and display employee name, department name and project name on which employee is working for the given employee number.

6.7 Write a PL/SQL block to display ENAME and SAL of all employees drawing salary more than 30000/-.

6.8 Do the exercise 6.7 using cursor for loop.

7. Week 7

7.1 Write PL/SQL block to give salary hike of 10% to first five highest paid employees, create a save point for salary hike given to each of five employees Calculate total amount paid by the company as salary to all employees and it should not exceed 500000/-(this amount can be assumed suitably). If it exceeds, rollback up to the recent previous save point and check again to know whether total salary lies below 500000/-

and so on. Commit the changes if total salary lies below 500000/-.

7.2 *Write a PL/SQL block to process Pay roll of all Employees by calculating Bonus(

considering Project Credits of projects in which they are

working),HRA,PF,TAX,GROSS and NET_SAL. Insert these salary details into a new

table PAYROLL(EmpNo, Pay_Date, Salary, Bonus, HRA, GROSS,PF, TAX,

NET_SAL). Note Salary is same as Sal from EMP table,

Bonus=Salary*Proj_Credits/100, HRA=10% of Salary, PF=10% of Salary

GROSS=Salary +Bonus + HRA, TAX=10% of GROSS, NET_SAL=GROSS-PFTAX.(Hint:

use two cursor one for EMP and another for different projects and their

credits)

7.3 Write a PL/SQL block (using parameterized cursor) to display first two employees

details (Name, Salary, Department Name) in ascending order by their salary and working in Project P1.

7.4 Write a PL/SQL block to accept, Principle, Interest rate and duration (in years) to calculate Interest to be paid. Handle the exceptions if Principle <=1000, interest rate <5 , year <1 and display proper error message for each.9

7.5 Write a PL/SQL block to accept employee number from user and display employee details such as Empno, Name, and Sal. Handle the exception raised –

(i) If user entered a non–existing employee number.

(ii) If the salary more than 25000/-

If employee exists and salary is less than 25000/- then update that salary to 25000/-

7.6 When the oracle looks for the exception OTHERS and give an example for a PL/SQL block where OTHERS is used and explain it.

7.7 * Write a PL/SQL block to insert record into EMP table with exception handling for oracle error numbers ORA-01438,ORA-01722,ORA-00904 and display proper error messages.

ORA-01438 –if salary value entered more than given digits width.ORA-01722 – if a character value is inserted into Salary (or to any numeric value column) ORA-00904 – if column name entered is incorrect.

8. Week 8

8.1 Write a PL/SQL trigger to fire when there is an updation of salary of any Empno and record the Empno, Dept. Name and Old Salary, date on which salary is modified and user name who modified information in the table SAL_MOD (Empno, Dname, Old_Sal, Mod_Date, Modifier)

8.2 Write a PL/SQL trigger to fire when there is an insert /update/deletes operation on EMP table; record the information in AUDIT_EMP table which has same structure as that of EMP along with a new column OPERATION (storesUPDATE/INSERT/DELETE depending on operation being done.)

8.3 Write a PL/SQL block trigger to do INSERT/UPDATE/DELETE operation onlyduring week days. Raise an exception if the day is SAT or SUN and also display user name who initiated operation.

8.4 Write a PL/SQL block trigger to check existence of child records in EMP table on Performing DELETE operation on DEPT table. If child records exists display message and cancel the delete operation otherwise perform delete operation.

8.5 Do the program 4.16 using INSTEAD OF option.

8.6 *Write PL/SQL block trigger to insert a record into a view EMP_DEPT_VIEW. Create the view containing EMPNO, ENAME, DATE_OF_BIRTH DEPTNO, and DNAME. Use INSTEAD OF option with trigger to make records to insert into underlying tables.

9. Week 9

9.1 Write a procedure to calculate simple interest, taking principle, rate and year as inputs.

9.2 Write a procedure to take SAL of given Employee as input and calculate HRA, PF,DA, GROSS, TAX and NETSAL and return them to calling PL/SQL block(take EMPNO as keyboard input to get SAL)

9.3 Write a function to calculate square of a number and return calculated value to calling PL/SQL block.

9.4 Write two functions to calculate age and service experience of all employees and return these values to calling PL/SQL block and display.

9.5 Write functions to find department name and number of projects it is handling.Display this information in the calling PL/SQL block.

9.6 Write a package containing procedure to calculate area of circle, perimeter and a function to find factorial of a number.

9.7 Write a package containing a procedure to display Employee name, department name, immediate superior name and a function to display retirement date by considering date of birth and retiring age as 65 years.

10. Week 10

Interfacing Oracle database with any latest front end and prepare GUI layout prototypes for the system under consideration.

11. Week 11

Implementing GUI layouts and application logic for the system under consideration.

12. Week 12

Completing the implementation of application for system under considerations andvalidation, basic functionality testing.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++ LAB

Course Code	Credit Units	Semester
BCI 323	01	3

CLO1: Read and understand Object oriented-based software code of medium-to-high complexity.
CLO2. Use standard and different type of Object oriented libraries when required for implementation.
CLO3: Understand the basic principles of creating Object oriented applications or program.
CLO4. Understand the fundamental concepts of computer science: structure of the computational process, algorithms and complexity of computation.

1. WAP to find greatest of three numbers.
2. WAP to calculate factorial of a number.
3. WAP to print Fibonacci series of 'n' numbers , where n is given by the programmer
4. WAP to check whether a number is prime or not.
5. WAP to find the number of characters and words in a string.
6. WAP to read a set of numbers in an array & to find the largest of them.
7. WAP to implement bubble sort using arrays.
8. WAP to read a set of numbers from keyboard & to find sum of all elements of the given array using a function.
9. WAP to exchange contents of two variables using call by value.
10. WAP to exchange contents of two variables using call by reference.
11. WAP to find the sum of three numbers using pointer to function method.
12. WAP to display content of an array using pointer arithmetic.
13. Calculate area of different geometrical figures (circle, rectangle, square, triangle) using function overloading.
14. WAP a program ro maintain the student record containing roll number , Name, marks1, marks2, marks3 as data member and getdata(), display() and setdata() as member functions(use array of object)
15. WAP to increment the employee salaries on the basis of there designation (Manager-5000, General Manager-10000, CEO-20000, worker-2000). Use employee name, id, designation, salary as data member and inc_sal as member function (Use array of object).
16. Write a class bank, containing data member: Name of Depositor, A/c type, Type of A/c, Balance amount. Member function: To assign initial value, To deposit an amount, to withdraw an amount after checking the balance (which should be greater than Rs. 500) , To display name & balance.
17. WAP to define nested class 'student_info' which contains data members such as name, roll number and sex and also consists of one more class 'date' ,whose data members are day, month and year. The data is to be read from the keyboard & displayed on the screen.

18. WAP to generate a series of Fibonacci numbers using copy constructor, where it is defined outside the class using scope resolution operator.
19. Write a program to add two complex numbers using friend function.
20. Write a class string to compare two strings, overload (= =) operator.
21. Write a class to concatenate two strings, overload (+) operator.
22. Create a class item, having two data members x & y, overload '-'(unary operator) to change the sign of x and y.
23. Create a class Employee. Derive 3 classes from this class namely, Programmer, Analyst & Project Leader. Take attributes and operations on your own. Write a program to implement this with array of pointers.
24. Create two classes namely Employee and Qualification. Using multiple inheritance derive two classes Scientist and Manager. Take suitable attributes & operations. Write a program to implement this class hierarchy.
25. Write a program to read data from keyboard & write it to the file. After writing is
26. Completed, the file is closed. The program again opens the same file, reads

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ENVIRONMENTAL STUDIES

Course Code	Credit Units	Semester
EVS 001	04	3

Course Objective:

The term environment is used to describe, in the aggregate, all the external forces, influences and conditions, which affect the life, nature, behaviour and the growth, development and maturity of living organisms. At present a great number of environment issues, have grown in size and complexity day by day, threatening the survival of mankind on earth. A study of environmental studies is quite essential in all types of environmental sciences, environmental engineering and industrial management. The objective of environmental studies is to enlighten the masses about the importance of the protection and conservation of our environment and control of human activities which has an adverse effect on the environment.

CLO 1: Communicate complex environmental information to both technical and non-technical audiences.
CLO 2: Understand and evaluate the global scale of environmental problems.
CLO 3: Reflect critically on their roles, responsibilities, and identities as citizens, consumers and environmental actors in a complex, interconnected world.

Course Contents:

Module I: The multidisciplinary nature of environmental studies

Definition, scope and importance
Need for public awareness

Module II: Natural Resources

Renewable and non-renewable resources:

Natural resources and associated problems
Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.
Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

Module III: Ecosystems

Concept of an ecosystem
Structure and function of an ecosystem

Producers, consumers and decomposers
Energy flow in the ecosystem
Ecological succession
Food chains, food webs and ecological pyramids
Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem
b. Grassland ecosystem
c. Desert ecosystem
d. Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries)

Module IV: Biodiversity and its conservation

Introduction – Definition: genetic, species and ecosystem diversity
Biogeographical classification of India
Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and option values
Biodiversity at global, national and local levels
India as a mega-diversity nation
Hot-spots of biodiversity
Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts
Endangered and endemic species of India
Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

Module V: Environmental Pollution

Definition

Causes, effects and control measures of:

a. Air pollution
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. Nuclear pollution

Solid waste management: Causes, effects and control measures of urban and industrial wastes.
Role of an individual in prevention of pollution.
Pollution case studies.
Disaster management: floods, earthquake, cyclone and landslides.

Module VI: Social Issues and the Environment

From unsustainable to sustainable development
Urban problems and related to energy
Water conservation, rain water harvesting, watershed management
Resettlement and rehabilitation of people; its problems and concerns. Case studies.
Environmental ethics: Issues and possible solutions
Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
Wasteland reclamation
Consumerism and waste products
Environmental Protection Act
Air (Prevention and Control of Pollution) Act
Water (Prevention and control of Pollution) Act

Wildlife Protection Act
Forest Conservation Act
Issues involved in enforcement of environmental legislation
Public awareness

Module VII: Human Population and the Environment
Population growth, variation among nations
Population explosion – Family Welfare Programmes
Environment and human health
Human Rights
Value Education
HIV / AIDS
Women and Child Welfare
Role of Information Technology in Environment and Human Health
Case Studies

Module VIII: Field Work
Visit to a local area to document environmental assets-river / forest/ grassland/ hill/ mountain.
Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
Study of common plants, insects, birds
Study of simple ecosystems-pond, river, hill slopes, etc (Field work equal to 5 lecture hours)

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
- Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad 380 013, India, Email:mapin@icenet.net (R)
- Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
- Clark R.S., Marine Pollution, Clanderson Press Oxford (TB)
- Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p
- De A.K., Environmental Chemistry, Wiley Eastern Ltd.
- Down to Earth, Centre for Science and Environment (R)
- Gleick, H.P. 1993. Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford Univ. Press. 473p
- Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
- Heywood, V.H & Waston, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press 1140p.

- Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi 284 p.
- Mckinney, M.L. & School, R.M. 1996. Environmental Science Systems & Solutions, Web enhanced edition. 639p.
- Mhaskar A.K., Matter Hazardous, Techno-Science Publication (TB)
- Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
- Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA, 574p
- Rao M N. & Datta, A.K. 1987. Waste Water treatment. Oxford & IBH Publ. Co. Pvt. Ltd. 345p.
- Sharma B.K., 2001. Environmental Chemistry. Geol Publ. House, Meerut
- Survey of the Environment, The Hindu (M)
- Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Science
- Trivedi R.K., Handbook of Environmental Laws, Rules Guidelines, Compliances and Standards, Vol I and II, Enviro Media (R)
- Trivedi R. K. and P.K. Goel, Introduction to air pollution, Techno-Science Publication (TB)
- Wanger K.D., 1998 Environnemental Management. W.B. Saunders Co. Philadelphia, USA 499p

DOMAIN ELECTIVE

WORKING AT A SMALL-TO-MEDIUM BUSINESS OR ISPs

Course Code	Credit Units	Semester
BCI 331	03	3

CLO 1: Understand the objectives of SME (SMALL-TO-MEDIUM BUSINESS)
CLO 2: To help develop the rural and less developed regions of the economy.
CLO 3: To reduce regional imbalances.
CLO 4: To create more employment opportunities.

Course Contents:

Module I: The Internet and Its Uses

What is the Internet, Internet Service Providers, and ISP Connectivity

Module II: ISP Help Desk

Help Desk Technicians, OSI Model, ISP Troubleshooting

Module III: Planning a Network Upgrade

Common Issues, Planning the Network Upgrade, Purchasing and Maintaining Equipment

Module IV: Planning the addressing structure

IP Addressing in the LAN, NAT and PAT

Module V: Configuring Network Devices

Initial ISR Router Configuration, Configuring an ISR with SDM, Configuring a Router Using IOS CLI, Initial Cisco 2960 Switch Configuration, Connecting the CPE to the ISP

Module VI: Routing

Enabling Routing Protocols, Exterior Routing Protocols

Module VII: ISP Services

Introducing ISP Services, Protocols that Support ISP Services, Domain Name Service Services and Protocols

Module VIII: ISP Responsibilities

ISP Security Considerations, Security Tools, Monitoring and Managing the ISP Backups and Disaster Recovery

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- CCNA-Discovery 4.0, module 2, Cisco Certified Networking Academy

References:

- Data Communication and Computer Network, Forozoun, TMH Publication
- Data Communication and Network, Stallings, PHI
- Computer Network, Tanenbaum, PHI

WEB DESIGNING

Course Code	Credit Units	Semester
BCI 332	**03**	**3**

CLO 1: Apply critical thinking and problem solving skills required to successfully design and implement a web site.
CLO 2: Demonstrate the ability to analyze, identify and define the technology required to build and implement a web site.

Course Contents:

Module I: Introduction to HTML

HTML Definition, Structure of HTML Document, HTML Elements, Web Browser, HTML History, HTML Editors, <!DOCTYPE> Declaration, Using Background Image, Marquee Tag, Headings, Paragraphs, Nested HTML Elements, Empty HTML Elements, HTML Attributes, HTML Styles, HTML Layout Elements and Techniques, HTML Symbol Entities Using Emojis in HTML, HTML Character Entities, HTML Text Formatting, Colors, Quotation and Citation Elements, HTML Comments Tags.

Module II: Introduction to HTML (contd…)

Hyper Links and Bookmarks, Images and Image Mapping and Its attributes, Tables and its attributes, Table Spacing and Padding, Rowspan, Colspan, Table Layout, Ordered Lists, Unordered Lists, Definition List, Nested Lists, Forms and its controls and attributes, IFrame, HTML Graphics, HTML Media.

Module III: Introduction to CSS

What is CSS, Inline CSS, Internal CSS, External CSS, CSS Color, Font, Sizes, CSS Border, CSS Padding, CSS Margins, Block Level Elements and Inline Elements, Class, ID, DIV, SPAN

Module IV: Working with Graphics and Images

Graphics, Images, Types of Images, Modifying the Brightness, Contrast, Size of Images, Changing the Image Resolution (dpi), SVG Intro, SVG in HTML, SVG Rectangle, SVG Circle, SVG Ellipse, SVG Line, SVG Polygon, SVG Polyline, SVG Path, SVG Text, SVG Stroking, SVG Filter Intro, SVG Blur Effects, SVG Drop Shadow, SVG Linear, SVG Radial.

Module V: Web Hosting

Web Hosting Basics, Types of Hosting Packages, Registering domains, Defining Name Servers, Using Control Panel, Creating Emails in Cpanel, Using FTP Client, Maintaining a Website

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- HTML, DHTML, JavaScript, Perl, CGI, Ivan Bayross, BPB Publication.
- HTML Complete Reference, BPB Publication.
- Internet for everyone, Alexis Leon and Mathew Leon, Leon Tech world.

ADVANCED TECHNOLOGIES IN COMPUTER SCIENCE

Course Code	Credit Units	Semester
BCI333	**03**	**3**

CLO 1: Recognize current and emerging disruptive technologies and their potential to impact social conditions, the economy, and daily life.
CLO 2: Compare and contrast current and emerging technologies and their implications for social ethics and the global workplace.
CLO 3: Appreciate the unique characteristics of and differences between disruptive technologies and their impacts.
CLO 4: Recognize the importance of ethical practices with new technologies.
CLO 5: Design a project plan that incorporates a new and emerging technology and illustrates its impact on organizations and industries.

Course Contents

Module I: Soft Computing
Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing.

Module II: Green Computing
Introduction to Green Computing, Websites, statistics, and government initiatives, Reducing the IT footprint, Computing technology for greener transportation, smarter buildings, Major green initiatives: Sustainable IT, Green Business, Smarter Plant

Module III: Internet of Things
Introduction – Concepts behind the Internet of Things, Trends and characteristics, Technologies behind the Internet of Things, Creative thinking techniques, application areas

Module IV: Civic technology
Civic technology, Smart city, e-democracy, open data, intelligent environment

Module V: Emerging Technologies
Brief introduction to emerging technologies: Quantum Computing, Parallel Computing, Pervasive Computing, High Performance Computing, Cluster computing, cloud computing, Super Computing

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Internet and Emerging Technologies 2nd Edition, by FADAIRO SIKIRUA (Author), MOORNING KIM
- Advanced Technologies: Building in the Computer Age (The Information Technology Revolution in Architecture) Paperback – June 1, 2001 by Valerio Travi

SUMMER PROJECT – I (Evaluation)

Course Code	Credit Units	Semester
BCA 351	**03**	**3**

CLO 1: Identify, Define and justify the scope of the proposed problem CLO 2: Propose an optimized solution among the existing solutions CLO 3: Apply to code, debugging, and testing tools for implementation CO 3: Prepare the proper documentation for report writing and oral presentation.

They are supposed to follow the following technologies:
C,
C++
DBMS

Guidelines:

There are certain phases of every Intern's professional development that cannot be effectively taught in the academic environment. These facets can only be learned through direct, on-the-job experience working with successful professionals and experts in the field. The internship program can best be described as an attempt to institutionalize efforts to bridge the gap between the professional world and the academic institutions. Entire effort in internship is in terms of extending the program of education and evaluation beyond the classroom of a university or institution. The educational process in the internship course seeks out and focuses attention on many latent attributes, which do not surface in the normal classroom situations. These attributes are intellectual ability, professional judgment and decision-making ability, inter-disciplinary approach, skills for data handling, ability in written and oral presentation, sense of responsibility etc.

In order to achieve these objectives, each student will maintain a file (**Internship File**). The Internship File aims to encourage students to keep a personal record of their learning and achievement throughout the Programme. It can be used as the basis for lifelong learning and for job applications. Items can be drawn from activities completed in the course modules and from the workplace to demonstrate learning and personal development.

The File will assess the student's analytical skills and ability to present supportive evidence, whilst demonstrating understanding of their organization, its needs and their own personal contribution to the organization.

The **layout guidelines** for the Project & Seminar Report:

1. File should be in the following specification

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components
Front Page

Table of Content
Acknowledgement
Student Certificate
Company Profile (optional)
Introduction
Main Body
References / Bibliography

The File will include ***five sections*** in the order described below. The content and comprehensiveness of the main body and appendices of the report should include the following:

1. **The Title Page**--Title - An Internship Experience Report For (Your Name), name of internship organization, name of the Supervisor/Guide and his/her designation, date started and completed, and number of credits for which the report is submitted.
2. **Table of Content**--an outline of the contents by topics and subtopics with the page number and location of each section.
3. **Introduction**--short, but should include how and why you obtained the internship experience position and the relationship it has to your professional and career goals.
4. **Main Body**--should include but not be limited to daily tasks performed. Major projects contributed to, dates, hours on task, observations and feelings, meetings attended and their purposes, listing of tools and materials and their suppliers, and photographs if possible of projects, buildings and co-workers.
5. **References / Bibliography** --This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system

ASSESSMENT OF THE INTERNSHIP FILE

The student will be provided with the Student Assessment Record (SAR) to be placed in front of the Internship File. Each item in the SAR is ticked off when it is completed successfully. The faculty will also assess each item as it is completed. The SAR will be signed by the student and by the faculty to indicate that the File is the student's own work. It will also ensure regularity and meeting the delaines.

STUDENT ASSESSMENT RECORD (SAR)

1. **Range of Research Methods used to obtain information**
2. **Execution of Research**
3. **Data Analysis**
    - Analyse Quantitative/ Qualitative information
    - Control Quality
4. **Draw Conclusions**

Examination Scheme:

Components	V	S	R	FP
Weightage (%)	20	20	20	40

V – Viva, S – Synopsis, FP – Final Presentation, R - Report

ANANDAM-III

Course Code	Credit Units	Semester
AND003	02	3

Course Learning Outcomes:

The student should develop:

- Awareness and empathy regarding community issues
- Interaction with the community and impact on society
- Interaction with mentor and development of Student teacher relationship
- Interaction among students, enlarge social network
- Cooperative and Communication skills and leadership qualities
- Critical thinking, Confidence and Efficiency

Course Objectives:

After the completion of this course, students will be able to:

- apply their knowledge and skills to solve specific community problem
- learn to plan, lead, and organize community events have a sense of belonging to their college campus and community and find something they are interested in doing during their free time
- make new friends, expand social network, and boost social skills and mental health.
- be useful to society as it will protect them against stress, frustration, and depression

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants, phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.
- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.
3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
6. For the topic chosen by the group, students are recommended to cover the following points:
    a) Current scenario (Regional, national and international level as applicable)
    b) Future predictions
    c) Duty of the government
    d) Government policies (related to the topic), if any
    e) Duty of public
    f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
    Conclusion is clearly stated. The underlying logic is explicit.

OPEN ELECTIVE

COMMUNICATION SKILLS – I

Course Name	Course Code	LTP	Credit	Semester
Professional Communication Skills	BCS 301	1:0:0	1	1

B. COURSE LEARNING OUTCOMES (CLO)

CLO 1	Inculcating creative thinking skills
CLO 2	Construct and showcase their communication skills in a creative manner.
CLO 3	Comprehending and demonstrating ways of self-introduction
CLO 4	Outlining and illustrating presentation Skills

B. SYLLABUS

Topic
Self-Actualization (Baseline, Self-Image Building, SWOT, Goal Setting)
Telephone Etiquette
GD-1 (Basics, Do's & Don'ts, Mannerism, Dynamics, GD Markers)
Book Review Presentation

EXAMINATION SCHEME:

Components	Self Introduction	GD	Book Review Presentation	Attendance
Weightage (%)	30	35	30	5

SUGGESTED READINGS

- Business Communication, Raman – Prakash, Oxford
- Creative English for Communication, Krishnaswamy N, Macmillan
- Textbook of Business Communication, Ramaswami S, Macmillan
- Writing Skills, Coe/Rycroft/Ernest, Cambridge

BEHAVIOURAL SCIENCE – III

(INTERPERSONAL COMMUNICATION AND RELATIONSHIP MANAGEMENT)

Course Code	Credit Units	Semester
BSS 303	01	3

Course learning outcomes (CLOs)

At the successful completion of this course you (the student) should be able to:

1. Demonstrate knowledge of strategies for developing a healthy interpersonal communication
2. Recognize the importance of transactional analysis, script analysis
3. Identify the difference between healthy and unhealthy expression of emotions and develop emotional competence necessary for conflict resolution and impression management.
4. Demonstrate knowledge of strategies for developing a healthy interpersonal relationship.

Course Objective:

This course aims at imparting an understanding of:

- Interpersonal communication and relationship.
- Strategies for healthy interpersonal relationship
- Effective management of emotions.
- Building interpersonal competence.

Course Contents:

Module I: Interpersonal Communication
Importance of Behavioural/ Interpersonal Communication
Types – Self and Other Oriented
Rapport Building – NLP, Communication Mode
Steps to improve Interpersonal Communication

Module II: Interpersonal Styles
Transactional Analysis
Life Position/Script Analysis
Games Analysis
Interactional and Transactional Styles
Bridging differences in Interpersonal Relationship through TA
Communication Styles

Module III: Conflict Management and Negotiation
Meaning and Nature of conflicts
Styles and techniques of conflict management
Meaning of Negotiation
Process and Strategies of Negotiation
Interpersonal Communication: Conflict Management and Negotiation

Module IV: Interpersonal Relationship Development
Importance of Interpersonal Relationships
Interpersonal Relationship Skills
Types of Interpersonal Relationships

Relevance of Interpersonal Communication in Relationship Development

Module V: Impression Management
Meaning & Components of Impression Management
Impression Management Techniques
Impression Management Training-Self help and Formal approaches

Examination Scheme:

Components	SAP	JOS	FC/MA/CS/HA	P/V/Q	A
Weightage (%)	25	15	30	25	05

SAP- Social Awareness Programme; **JOS**-Journal of Success; **HA**-Home Assignment; **P**-Presentation; **V**-Viva; **Q**-Quiz; **FC-** Flip class; **MA-** Movie Analysis; **CS-** Case study; **A**-Attendance

Text & References:

- Vangelist L. Anita, Mark N. Knapp, Inter Personal Communication and Human Relationships: Third Edition, Allyn and Bacon
- Julia T. Wood. Interpersonal Communication everyday encounter
- Beebe, Beebe and Redmond; Interpersonal Communication, 1996; Allyn and Bacon Publishers.
- Rosenfeld, P., Giacalone, R.A. and Catherine, A.R. (2003). Impression Management: Building and Enhancing Reputations at Work. Thomson Learning, Singapore.

FRENCH - III

Course Code	Credit Units	Semester
FLT 301	02	3

Course Learning Objective:

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts .
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self introduction, family description etc

- To understand and present the time schedule and to tell the time
- To understand and draft a short biography and to present a scientist
- To understand an online conversation and read a program and the timings.
- To propose an outing and to accept an outing.
- To leave a message on the answering machine

Course Contents:

Unité 3 La science au quotidien Page : 40-61 Leçons 7, 8 & 9

Contenu Lexical:

1. L'heure
2. Les jours de la semaine
3. Les mois de l'année
4. Les matières et types de cours
5. Les spécialitésscientifiques.
6. L'annéeuniversitaire
7. Les nationalités
8. Les noms de pays
9. Les métiers scientifiques
10. Les chiffres de 69 à l'infini
11. Quelquesunités de mesure
12. Quelquestermesscientifques
13. Les termes de l'exposition
14. Les expression familières pour accepter une invitation.

Contenu Grammatical:

1. Finir, commencer au présent
2. Les prepositions de temps
3. Féminins et masculine des noms de métiers scientifiques
4. Les adjectifs de nationalité.
5. Le future proche

6. Les adjectifs demonstratives
7. Le but: pour + infinitive
8. Le register familier

EXAMINATION SCHEME

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					End Sem Evaluation (Total 50 Marks)
Quiz	**Mid Term Test**	**Presentation**	**Viva Voce**	**Attendance**	**End-Term Exam**
10	**15**	**10**	**10**	**5**	**50**

Text & References:

- Le Gargasson, I. Naik, S. Chaize, C. (2012) Tech French, Delhi : Goyal Publications
- Ray. A, Robert (2010) Le Petit Robert French Dicitionary, Paris: Le Robert
- Robert, Collins (2006) Collins Robert French Dictionary, Paris : Harper Collins

GERMAN - III

Course Code	Credit Units	Semester
FLG 301	02	3

Course Learning Objective:

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts .
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self introduction, family description etc.

After successful completion of this semester, students will be able to:

- describe furniture in a room.
- ask question related to time like when, from when etc.
- tell time (formal and informal)
- how to make calls on phone
- can excuse for cancel appointments.
- speak about their daily routine.

Course Contents

Vocabulary:

- Furniture
- Days and months name
- Time vocabulary like 15 min, quarter, minute, seconds.
- Adjectives use to describe furniture.

Grammar:

- Past participle of verb had
- Usage of negation like **not = nicht; kein= not a single.**
- Preposition of time.
- Use of adjective in sentences.
- Introduction and use of separable verbs

EXAMINATION SCHEME

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					End Sem Evaluation (Total 50 Marks)
Quiz	**Mid Term Test**	**Presentation**	**Viva Voce**	**Attendance**	**End-Term Exam**
10	**15**	**10**	**10**	**5**	**50**

Prescribed Text-Book: First 10 Lessons from Deutschals Fremdsprache -1B, INBH & Oxford, New Delhi, 1977
References: **Studio D A1** by Hermann Funk, Christina Kuhn and Silke Demme, Cornelsen, 2013

Tangram A1by Rosa Maria Dallapiazza, Eduard von Jan & Till Schoenherr, Max Hueber, 2007

SprachtrainingA1 by Rita Maria Niemann, Dong Ha Kim, Cornelsen, 2013
Dictionaries for reference: **Studio D: Glossar** A1 - Deutsch –Englisch, Cornelsen, 2013
http://www.duden.de/woerterbuch
Materials are given in form of photocopies if felt to be necessary

SPANISH – III

Course Code	Credit Units	Semester
FLS 301	02	3

Course Learning Objective:

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts .
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.
- Students will be able to communicate in small sentences in oral, self introduction, family description etc.
  - To enable the students to talk about a place like, class room, market, neighborhood and location of thing with the use of prepositions.
  - To talk about one's likes/dislikes, how one is feeling, to express opinions, pain and illness.
  - Time and date
  - Speaking about prices/currency/ market and quantity.
  - Counting above 100,
  - To discuss near future plans

Course Content

Vocabulary:

Vocabulary pertaining to describe people/ place /objects, Illness, Currency, Market etc. preferences, opinions , body parts etc.

Grammar:

Introduction of stem changing irregular verbs
Introductionofprepositions (Cerca de/ lejos de/ encima de etc.)
Present continuous tense **(Estar+ gerundio)**
Introduction of third person verbs Gustar/Parecer/Encantar/ Doleretc
Interrogatives – How much/ How many
Introduction of irregular verbs.
Immediate uture plans (Ir a + verbo)

Examination Scheme:

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					End Sem Evaluation (Total 50 Marks)
Quiz	Mid Term Test	Presentation	Viva Voce	Attendance	End-Term Exam
10	15	10	10	5	50

Skills Evaluated: Writing, Comprehension, grammar, and Vocabulary

Text &References:
Nuevo Español Sin Fronteras (ESF1) by Jesús sánchez Lobato, Concha Moreno Garcia, Concha Moreno Garcia, Isabel Santos Gargallo, Sociedad General Española De Librería, S.A 2005
Pasaporte Nivel (A1) byMatideCerraloza Aragón, oscarCerraloza Gilli, Begoña Llovet Barquero, EdelsaGroup didascalia, S.A. 2005
Dictionaries for reference: Collins, www.wordreferences.com.
Essential materials are given in the form of photocopies.

CHINESE – III

Course Code	Credit Units	Semester
FLC 301	02	3

Course Learning Objectives:

- Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
- Students will be able to read and interpret small texts .
- Students will be able to communicate in small sentences in writing, self introduction, family description etc.

Students will be able to communicate in small sentences in oral, self introduction, family description etc

On the completion of third semester the students will be able to attain the proficiency of HSK-I and they will be able to

- Read Chinese words, phrases and simple sentences both in Pin Yin and Characters given in the text.
- Write Chinese Characters and sentences.
- Speak Chinese dialogues from various fields of day to day life.
- Listen and understand simple Chinese words and dialogues used in syllabi.
- Carry out conversation in the target language.
- Manipulate basic grammatical structures such as: 在 是 有 sentence, etc.
- Master and use most essential vocabulary items of day to day use and programme specific vocabulary; approx 100 Characters including 50 characters of HSK level -I.

COURSE CONTENTS

1. Description of size
2. Description of quantity
3. Asking and replying questions on shopping
4. Asking and replying questions on Communication
5. Conversation Related to Study
6. Conversation Related to Work
7. Expression of Simple Feelings
8. Listening of dialogues
9. Conversation based on dialogues
10. Programme Specific Vocabulary & Expressions
11. Chinese CBT Package
12. Chinese Festivals (In English)

VOCABULARY CONTENTS

1. Vocabulary will include approx 100 Characters including 50 Characters of HSK-I level.

2. Vocab related to size, quantity, shopping, communication, study, work and simple feelings and Programme Specific Vocabulary will be covered during this semester.

3. By the end of third semester the students will be able to master all 150 characters set for the HSK level-I.

GRAMMATICAL CONTENTS

1. Antonyms
2. Prepositional phrases
3. The object of 在， 从
4. Complement of degree
5. Preposed object
6. Verb 在
7. 有 and 是 indicating existence
8. Question of type (4)
9. The 是 sentence type (2).
10. Sentence with a verb taking two objects

EXAMINATION SCHEME

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					End Sem Evaluation (Total 50 Marks)
Quiz	**Mid Term Test**	**Presentation**	**Viva Voce**	**Attendance**	**End-Term Exam**
10	**15**	**10**	**10**	**5**	**50**

Text & References

1. Learn Chinese with me book-I (Major Text book), People's Education Press

2. Elementary Chinese Reader Book-I

2. Chinese reader (HSK Based) book-I

3. Module on Programme specific vocab.

COMPUTER GRAPHICS

Course Code	Credit Units	Semester
BCI 401	03	4

CLO1: Students will be able to use computer graphics and its different application.
CLO2: Define basic graphics workstation working mechanism.
CLO3: Demonstrate advantages and disadvantages of different drawing algorithms.
CLO4: determine and demonstrate different graphics algorithm implementations.
CLO5: Describe and apply computer graphics algorithms and design different objects using it.

Course Contents:

Module I: Introduction of Graphics
Development of Computer Graphics, Basic Graphics System and Standards.
Graphics Devices:
Raster and Random Scan Devices, Continual Refresh and Storage Displays, Display Processor, Color Display Techniques, Frame Buffer, Concepts in Raster Graphics.

Module II: Graphics Primitives
Points, Pixels, Scan Conversion, Line Drawing Algorithms, Circle Drawing Algorithms, Anti-aliasing Technique, Character generator
Polygon
Polygon representation, Polygon Filling, Inside/Outside Testing

Module III: Transformation
Scaling, Translation, Rotation, Coordinate Axis Rotation, Reflection, Shears, Composite Transformation, Modeling and Coordinate Transformation
Viewing: Two – Dimensional Viewing, Viewing transformation, Interactive Picture Construction Techniques, Interactive Input/Output Devices,

Module IV: Segment
Segment Table, Creating Deleting and Renaming a Segment, Visibility and Image Transformation
Windowing and Clipping: Window, View-port, Line clipping, polygon clipping, Multiple Windowing

Module V: Three Dimensional Concepts
3-D Representation and Transformation, 3-D Viewing, Algorithm for 3-D Volumes, Introduction to Spline Curves and Surfaces

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:
- Computer Graphics By Donald Hearn And Pauline Baker
- Harrington's "Computer Graphics " A Programming Approach

References:
- Principle of Interactive Computer Graphics By New, W. M. And Spraull
- Foley "Computer Graphics" Addission Wesley
- Rogers' "Procedural Elements Of Computer Graphics " Mc-Grawhilll

DESIGN AND ANALYSIS OF ALGORITHMS

Course Code	Credit Units	Semester
BCI 402	03	4

CLO1: Define the algorithms time and space complexity and analyze the algorithm.
CLO2: Describe the divide and conquer strategy and its application.
CLO3: Apply algorithms and design techniques to solve problems.
CLO4: Compare different algorithms and find out the best solution according to constraints.
CLO5: Evaluate the problems in different domains.

Course Contents:

Module I: Introduction
Algorithms, Analyzing algorithms, Designing algorithms.
Mathematical Foundations: Growth of Functions-Asymptotic natation, Recurrence
The substitution Method, Recursion tree method, Master Method.

Module II: Sorting and Order statistics
Divide & Conquer Strategy, Heap Sort, Quick Sort, V. stressen Matrix Multiplication, Sorting in Linear time.
Data Structures: Elementary data structures, hash tables, Binary search trees.

Module III: Advanced Design and Analysis Techniques
Dynamic programming- Elements of
dynamic programming, Chain-matrix multiplication, All pair shortest path (Flayed -algorithm), Optimal Binary Search. Tree.
Greedy algorlthms - Elements of the greedy strategy, Huffman codes, SIngle-source shortest path in a directed graph, Knapsack problem, Minimun Spmming trees- The Algorithm of Kruskals and Prims.

Module IV: Graph Algorithms
Elementary graphs Algorithms, Minimum spanning Trees, Single source Shortest paths, All Pair Shortest Paths.
Selected Topics: Sorting Networks, Algorithms for Parallel Computers.

Module V
Polynomials and tile FFT, String Matching, NP-Completeness, Approximation Algorithms.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:
- Coreman, Rivest, Lisserson, "Algorithms", PHI

References:
- Horowitz & Sahni," Fundamental of Computer Algorithm", Galgotia. Aho, Hopcropt, Ullman,
- Data Structure & Algoritlull", Addision Wesley.

OPERATING SYSTEMS

Course Code	Credit Units	Semester
BCI 403	03	4

CLO1: Describe the important computer system resources and the role of operating system in their management policies and algorithms
CLO2: Understand the process management policies and scheduling of processes by CPU
CLO3: Describe and analyse the memory management and its allocation policies.

Course Contents:

Module I: Operating System as a Resource Manager
Operating System Classifications
Monitor, Multiprogramming, Time Sharing, Real Time Systems,
Multiprocessor Systems and Operating System Services.

Module II: CPU Scheduling
Basic Scheduling Concepts, Process Overviews, Process States, Multiprogramming,
Scheduler and Scheduling Algorithms, Multiple Processor Scheduling

Module III: Memory Management
Bare Machine, Resident Monitor, Partition, Paging and Segmentation, Virtual Memory and Demand Paging, Replacement Policies, Cache Memory

Module IV: File Systems
File Support, Access Methods
Allocation Methods- Contiguous Linked and Index Allocation
Directory Systems
Single Level, Tree Structured, Acyclic Graph and General Graph Directory, File Protection
Deadlock
Deadlock Characterization, Deadlock Prevention, Deadlock Avoidance and Deadlock Recovery
Module V: Security and Protection
Security Policies and Mechanism
Protection and Access Control-Access Matrix Model of Protection, Access Hierarchies, Access List, Capabilities
Overview of UNIX Operating System
Command-Language User's View of Unix, Implementation of Unix, Unix Summary Etc.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:
- Peterson and Silberschatz, Operating System Concepts

References:
- Tannenbaum A.S., Modern Operating System
- Crowly Charrles , Operating System- A design Approach
- Dietel H.M., Operating Systems

COMPUTER ORIENTED NUMERICAL METHODS

Course Code	Credit Units	Semester
BCA 404	03	4

CLO1. Identify the concepts of numerical analysis, which will able to understand the concept of error analysis, zeros of transcendental equations.
CLO2. Choose appropriate numerical method for treatment of the given problem. CLO 4. Develop the fundamentals and concepts of different mathematical problems and reformulate them in a way that is appropriate for numerical treatment for eg. Solution of ordinary differential equations etc.
CLO3. Apply critical thinking skill to solve numerical differentiation and integration instead of analytical method

Course Contents:

Module I: Numeric Computation

Computer Arithmatic- Floating point numbers-operations, Normalization and their Consequences, Absolute, Relative and Percent Error.

Iterative Methods:- Zeros of a single Transacendental equations and Zeros of Polynomial Equations using Bisection ,False Position, Newton-Raphson Methods, Convergence of Solution.

Module II: Simultaneous Linear Equations

Solution of Simultaneous Linear Equations. Direct Methods:- Gauss elimination method, Pivoting, Gauss-Jordan Method. Iterative methods:-Jacobi's Methods, Gauss-Seidal Method.

Module III: Polynomial Interpolation

Newtons divided difference, Forward and backward difference Formulae, Difference Tables, Lagrange's Method.

Module IV: Numerical Differentiation and Integration

Formula for first and second order derivatives using newton's- Forward and Backward formula, Numerical Integartion, Newton-Cotes Formula: Trapizoidal rule, Simpson's $1/3^{rd}$ rule ,Simpson's $3/8^{th}$ rule, Weddle's rule.

Module V: Numerical Solution of Differential Equations

Basic Terminology of Differential Equations, Picard's Method, Euler's method, Taylor's Series method, Runge-Kutta Methods, Predictor –Connector Method.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Jain M.K, Jain R.K and Iyenger, Numerical Methods for Scientific and Engineering Applications.

References:

- Rajaraman V, Computer Oriented Numerical Methods.
- Krishnamuty, E.V., Sen, S.K, Computer Based Numerical Algorithms.
- Stoer, Bullrich, Computer Oriented Numerical Methods.

SOFTWARE ENGINEERING

Course Code	Credit Units	Semester
BCA 405	03	4

CLO1: To define basic concepts of software development such as requirement analysis, designing, testing and debugging etc.
CLO2: To explain different types of models that can be used to design a software.
CLO3: To design solutions to a given problem and analyze the best one on the basis of parameters like cost, time, knowledge.
CLO4: To apply the various testing techniques and testing tools.
CLO5: To explain the importance of reliability in software development.

Course Contents:

Module I: Software Development Life Cycle
Evolution of Software Engineering, Software Problems, Issues Involved in Software Engineering, Fundamental Qualities of a Software Product, Approaches to Software Engineering, Planning the development Process, Development/Product Life-Cycle Model, Kinds of Software Life-Cycle Model.

Module II: Project Management
Project Management Concepts, Project Management Activities, Size Metrics. Software Requirement analysis and Specification, Cost Models.

Module III: System Design
Design Objectives, Design Principles, Effective Modular Design (Functional Independence, Coupling, and Cohesion), Design Tools and Techniques, Prototyping, Structured Programming.

Module IV: Coding
Programming Practices, Verification, Monitoring and Control.

Module V: Software Testing
Testing Fundamentals, Test case design, Functional Testing, Structural Testing, Test Plan, Activities during testing, Unit System, Integration Testing, Software Maintenance.

Module VI: Software Reliability
Concept of Software Reliability, Software Repair and Availability, Software Errors, Failure and Faults.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Software Engineering, A Practitioner's Approach - Roger S. Pressman.

References:

- An Integrated Approach to Software Engineering, Pankaj Jalote.
- Software Engineering Concepts, Richard Fairley.

COMPUTER GRAPHICS LAB

Course Code	Credit Units	Semester
BCI 421	01	4

CLO1. Read and understand Computer graphics code of medium-to-high complexity.

CLO2. Use standard and different type of Graphics libraries when required for implementation.

CLO3. Understand the basic principles of creating Computer Graphics applications or program.

CLO4. Understand the fundamental concepts of computer graphics implementation.

PART - I

Computer Graphics Programmes

1) Write a program to change the working mode from text to graphics and plot a pixel.
2) Write a program to draw a line of same dimension in three different graphics mode.
3) Write a program to display line, rectangle, circle and polyline using graphics command.
4) Write a program to draw a line of slope between 0 and 1 using DDA algorithm.
5) Write a program to draw a line of slope between 1 and ∞ using DDA algorithm.
6) Write a program to draw a line of slope between 0 and 1 using midpoint algorithm.
7) Write a program to draw a line of slope between 1 and ∞ using midpoint algorithm
8) Write a program to draw a dashed line of slope 1 using any line algorithm
9) Write a program to draw a dotted line of slope 1 using DDA algorithm
10) Write a program to draw a line of slope between 0 and -1 using midpoint algorithm.
11) Write a program to draw a line of slope between -1 and -∞ using midpoint algorithm.
12) Write a program to draw an octant of a circle with it's center at point (0,0) a using midpoint circle drawing.
13) Write a program to draw a circle with its center at point (0, 0) and radius r using midpoint circle drawing.
14) Write a program to draw an octant of a circle with it's center at point (a, b) and radius r using midpoint circle drawing.
15) Write a program to a circle with it's center at point (a, b) and radius r using midpoint circle drawing.
16) Write a program to fill a polygon using flood-fill method.
17) Write a program to fill a polygon using boundary-fill method.
18) Write a program to reflect a point in X and Y-axis both.
19) Write a program to rotate a point (100, 50) about origin in anti-clock wise direction.
20) Write a program to rotate a point (100,150) about point (30, 40) in clock wise direction..

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

DOMAIN ELECTIVE
INTRODUCTION TO .NET TECHNOLOGIES

Course Code	Credit Units	Semester
BCI 431	**03**	**4**

CLO1: This Introduction to .NET Programming training course provides hands-on experience creating software for Microsoft's .NET (Windows platform) using the Visual Studio development environment. Starting with the most fundamental elements of computer programming, the training evolves to leverage development techniques sufficient to produce a complete web application including the user interface, business logic and data access layers. You learn how to write code using Visual Basic (VB) and C#; create ASP.NET Web applications and process Web forms and build SQL Server databases and access them using ADO.NET.
CLO2: Participants have the choice of using either C# (C Sharp) or VB (Visual Basic) – the Microsoft .NET core languages. Techniques presented include design, code generation, testing and debugging including use of the ASP.NET (Active Server Pages) the SQL Server database.

Course Contents:

Module I: Introduction to .NET technologies

Features of .NET, .NET Framework, CLR framework, MSIL, .NET class library, .NET Languages, CTS, assemblies, manifest, and metadata, What is ASP.NET?, Difference between ASP and ASP.NET.

Module II: Introduction to C#, Variables and expressions, flow controls, functions, debugging and error handling, OOPs with C#, Defining classes and class members, collections, Type Casting, String functions, Indexers, Delegates and events.

Module III: Controls in ASP.NET

Overview of Dynamic Web page, Understanding ASP.NET Controls, Applications, Web servers, Installation of IIS. Web forms, web form controls -server controls, client controls. Adding controls to a web form, Buttons, Text Box, Labels, Checkbox, Radio Buttons, List Box. Adding controls at runtime. Running a web Application, creating a multiform web project. Form Validation: Client side validation, server Side validation, validation Controls: Required Field Comparison Range. Calendar control, Ad rotator Control, Internet Explorer Control, Dynamic Controls.

Module IV: Overview of ADO.NET and XML

What is ADO.NET, from ADO to ADO.NET? ADO.NET architecture, Accessing Data using Data Adapters and Datasets , using Command & Data Reader, binding data to data bind Controls, displaying data in data grid, XML basics, attributes, fundamental XML classes: Document, text writer, text reader. XML validations, XML in ADO.NET, The XML Data Document.

Module V: ASP.NET Applications and Web services

Creating, tracking, caching, error handling, Securing ASP.NET applications- form based applications, window based application. Introduction, State management- View state, Session state, Application state, Building ASP.NET web services, working with ASP.NET applications, creating custom controls.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- ASP.NET Unleashed by Stephen Walther, SAMS publications

References:

- ASP.NET, Wrox Publications
- ASP.NET and VB.NET, Wrox Publication
- ASP.NET and C#.NET, Wrox publication.

INTRODUCTION TO OPEN SOURCE TECHNOLOGIES
(PHP, Mysql)

Course Code	Credit Units	Semester
BCI 432	03	4

CLO1: Learn how to create an interactive website, allowing visitors to post and retrieve information provided by you or your site's visitors. In this online course, you'll see how to create dynamic web pages using the PHP programming language and the MySQL database server.
CLO2: During the course, you'll walk through the development of a complete content management system web application. You'll receive clear, step-by-step, instructions demonstrating how to create a complete website capable of dynamically displaying data from a MySQL database.
CLO3: You'll discover how you can allow your site's visitors to add new information to an online database, search through posted data, and create meaningful printed reports. By the end of this course, you'll have plenty of useful code templates that will help you create your very own dynamic, web-based, content management system.

Course Contents:

Module I: Introduction to PHP programming
Introduction to PHP, installation and configuration, Variables, String functions, Numeric functions

Module II: Operator, Loops and Array
Operators, Conditions, Loops, Array, Multidimensional Array, Associative array

Module III: Classes and Functions
Classes, Regular Expr, Working with Datetime, code re-use, require (), include (), and the include-path; filesystem functions, and file input and output; file uploads; error handling and logging; sending mail,

Module IV: Working with database
MYSQL, Introducing MySQL; database design concepts; the Structured Query, Language (SQL); communicating with a MySQL backend via the PHP, MySQL API Building Database Applications,

Module V: Working with Frameworks
Working with Wordpress, Mambo, Joomla, OS Commerce, Zend Framework, Drupal

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Beginning PHP, Apache, MySQL Web Development
- Michael K. Glass, Yann Le Scouarnec, Elizabeth Naramore, Gary Mailer, Jeremy Stolz, Jason Gerner

References:

- PHP Manual.

INTRODUCING ROUTING AND SWITCHING IN THE ENTERPRISE

Course Code	Credit Units	Semester
BCI 433	**03**	**4**

CLO1: This course familiarizes students with the equipment applications and protocols installed in enterprise networks, with a focus on switched networks, IP Telephony requirements, and security. It also introduces advanced routing protocols such as Enhanced Interior
CLO2: Gateway Routing Protocol (EIGRP) and Open Shortest Path First (OSPF) Protocol. Hands-on exercises include configuration, installation, and troubleshooting.

Course Contents:

Module I: Networking in the Enterprise

Describing the Enterprise Network, Identifying Enterprise Applications

Module II: Exploring the Enterprise Network Infrastructure

Describing the Current Network, Supporting the Enterprise Edge, Reviewing Cisco Routing and Switching

Module III: Switching in an Enterprise Network

Describing Enterprise Level Switching, Preventing Switching Loops, Configuring VLANs, Trunking and Inter-VLAN Routing, Maintaining VLANs on an Enterprise Network

Module IV: Addressing in an Enterprise Network

Using a Hierarchical IP Network Address Scheme, Using VLSM, Using Classless Routing and CIDR, Using NAT and PAT

Module V: Routing with a Distance Vector Protocol

Managing Enterprise Networks, Routing Using the RIP Protocol, Routing Using the EIGRP Protocol, Implementing EIGRP

Module VI: Routing with a Link-State Protocol

Routing Using the OSPF Protocol, Implementing Single-Area OSPF, Using Multiple Routing Protocols

Module VII: Implementing Enterprise WAN Links

Connecting the Enterprise WAN, Comparing Common WAN Encapsulations
Using Frame Relay

Module VIII: Filtering Traffic Using Access Control Lists

Using Access Control Lists, Using a Wildcard Mask, Configuring Access Control Lists, Permitting and Denying Specific Types of Traffic, Filtering Traffic Using Access Control Lists

Module IX: Troubleshooting an Enterprise Network

Understanding the Impact of Network Failure, Troubleshooting Switching and Connectivity Issues, Troubleshooting Routing Issues, Troubleshooting WAN Configurations, Troubleshooting Access Control List Issues

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- CCNA-Discovery 4.0, module 3, Cisco Certified Networking Academy

References:

- Data Communication and Computer Network, Forozoun, TMH Publication
- Data Communication and Network, Stallings, PHI
- Computer Network, Tanenbaum, PHI

CLOUD COMPUTING

Course Code	Credit Units	Semester
BCA 434	**03**	**4**

CLO1 : Investigate different concepts of cloud computing in terms of an individual, organization.
CLO 2: Create theories, methods and interpretations of theories within the field of cloud computing as well as solving theoretical and practical problems independently.
CLO3. Apply his/her knowledge in new areas within field of cloud computing
CLO 4: Develop independently relevant methods in research and development in the field of cloud computing. These methods include literature study and performing scientific experiments together with interpreting their results.

Course Contents

MODULE I: CLOUD ARCHITECTURE AND MODEL

Technologies for Network-Based System – System Models for Distributed and Cloud Computing – NIST Cloud Computing Reference Architecture. Cloud Models:- Characteristics – Cloud Services – Cloud models (IaaS, PaaS, SaaS) – Public vs Private Cloud –Cloud Solutions - Cloud ecosystem – Service management – Computing on demand.

MODULE II: VIRTUALIZATION

Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization - Virtualization Structures - Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices - Virtual Clusters and Resource management – Virtualization for Data-center Automation.

MODULE III: CLOUD INFRASTRUCTURE

Architectural Design of Compute and Storage Clouds – Layered Cloud Architecture Development – Design Challenges - Inter Cloud Resource Management – Resource Provisioning and Platform Deployment – Global Exchange of Cloud Resources.

MODULE IV: PROGRAMMING MODEL

Parallel and Distributed Programming Paradigms – MapReduce , Twister and Iterative MapReduce – Hadoop Library from Apache – Mapping Applications - Programming Support - Google App Engine, Amazon AWS - Cloud Software Environments -Eucalyptus, Open Nebula, OpenStack, Aneka, CloudSim

MODULE V: SECURITY IN THE CLOUD

Security Overview – Cloud Security Challenges and Risks – Software-as-a-Service Security – Security Governance – Risk Management – Security Monitoring – Security Architecture Design – Data Security – Application Security – Virtual Machine Security - Identity Management and Access Control – Autonomic Security.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- John W.Rittinghouse and James F.Ransome, "Cloud Computing: Implementation, Management, and Security", CRC Press, 2010.
- Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach", TMH, 2009.
- Kumar Saurabh, "Cloud Computing – insights into New-Era Infrastructure", Wiley India,2011.
- James E. Smith, Ravi Nair, "Virtual Machines: Versatile Platforms for Systems and Processes", Elsevier/Morgan Kaufmann, 2005.
- Ronald L. Krutz, Russell Dean Vines, "Cloud Security – A comprehensive Guide to Secure Cloud Computing", Wiley – India, 2010.

BIG DATA ANALYTICS

Course Code	Credit Units	Semester
BCA 435	**03**	**4**

CLO1: Understand the Big Data Platform and its Use cases
CLO2: Provide an overview of Apache Hadoop
CLO3: Provide HDFS Concepts and Interfacing with HDFS
CLO4: Understand Map Reduce Jobs
CLO5: Provide hands on Hodoop Eco System
CLO6: Apply analytics on Structured, Unstructured Data. Exposure to Data Analytics with R

Course Contents:

Module I Introduction to Big Data

Introduction – distributed file system – Big Data and its importance, Four Vs, Drivers for Big data, Big data analytics, Big data applications. Algorithms using map reduce, Matrix-Vector Multiplication by Map Reduce.

Module II Introduction Hadoop

Big Data – Apache Hadoop & Hadoop EcoSystem – Moving Data in and out of Hadoop – Understanding inputs and outputs of MapReduce - Data Serialization.

Module III Hadoop Architecture

Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands , Anatomy of File Write and Read., NameNode, Secondary NameNode, and DataNode, Hadoop MapReduce paradigm, Map and Reduce tasks, Job, Task trackers - Cluster Setup – SSH & Hadoop Configuration – HDFS Administering – Monitoring & Maintenance.

Module IV Hadoop Ecosystem and Yarn

Hadoop ecosystem components - Schedulers - Fair and Capacity, Hadoop 2.0 New Features- NameNode High Availability, HDFS Federation, MRv2, YARN, Running MRv1 in YARN.

Module V HIVE AND HIVEQL, HBASE

Hive Architecture and Installation, Comparison with Traditional Database, HiveQL - Querying Data - Sorting And Aggregating, Map Reduce Scripts, Joins & Subqueries, HBase concepts- Advanced Usage, Schema Design, Advance Indexing - PIG, Zookeeper - how it helps in monitoring a cluster, HBase uses Zookeeper and how to Build Applications with Zookeeper.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, "Understanding Big
- Data: Analytics for Enterprise Class Hadoop and Streaming Data", McGrawHill Publishing, 2012
- Bill Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", JohnWiley & sons, 2012.

INTRODUCTION TO .NET TECHNOLOGIES LAB

Course Code	Credit Units	Semester
BCI 441	**01**	**4**

CLO1: This Introduction to .NET Programming training course provides hands-on experience creating software for Microsoft's .NET (Windows platform) using the Visual Studio development environment. Starting with the most fundamental elements of computer programming, the training evolves to leverage development techniques sufficient to produce a complete web application including the user interface, business logic and data access layers. You learn how to write code using Visual Basic (VB) and C#; create ASP.NET Web applications and process Web forms and build SQL Server databases and access them using ADO.NET.
CLO2: Participants have the choice of using either C# (C Sharp) or VB (Visual Basic) – the Microsoft .NET core languages. Techniques presented include design, code generation, testing and debugging including use of the ASP.NET (Active Server Pages) the SQL Server database.

Course Contents:

1. Write a console application that obtains four int values from the user and displays the product.
2. If you have two integers stored in variables var1 and var2, what Boolean test can you perform to see if one or the other (but not both) is greater than 10?
3. Write an application that includes the logic from Exercise 1, obtains two numbers from the user, and displays them, but rejects any input where both numbers are greater than 10 and asks for two new numbers.
4. Write a console application that places double quotation marks around each word in a string.
5. Write an application that uses two command-line arguments to place values into a string and an integer variable, respectively. Then display these values.
6. Write an application that receives the following information from a set of students: Student Id: Student Name: Course Name: Date of Birth: The application should also display the information of all the students once the data is entered. Implement this using an Array of Structures.
7. Write programs using conditional statements and loops:
   - Generate prime numbers.
   - Generate various patterns (triangles, diamond and other patterns) with numbers.
8. Write a program to declare a class ‘staff’ having data members as name and post. Accept this data 5for 5 staffs and display names of staff who are HOD.
9. Write a program to declare class ‘Distance’ have data members dist1, dist2, dist3. Initialize the two data members using constructor and store their addition in third data member using function and display addition.
10. Write a program using function overloading to swap two integer numbers and swap two float numbers.
11. Write a program to implement single inheritance.
12. Define a class ‘salary’ which will contain member variable Basic, TA, DA, HRA. Write a program using Constructor with default values for DA and HRA and calculate the salary of employee.
13. Write a program for above class hierarchy for the Employee where the base class is Employee and derived class and Programmer and Manager. Here make display function virtual which is common for all and which will display information of Programmer and Manager interactively.
14. Write a program to accept a number from the user and throw an exception if the number is not an even number.
15. Create an application that allows the user to enter a number in the textbox named ‘getnum’. Check whether the number in the textbox ‘getnum’ is palindrome or not. Print the message accordingly in the label control named lbldisplay when the user clicks on the button ‘check’.
16. Create an application which will ask the user to input his name and a message, display the two items concatenated in a label, and change the format of the label using radio buttons and check boxes for

selection , the user can make the label text bold ,underlined or italic and change its color . include buttons to display the message in the label, clear the text boxes and label and exit.

17. Create a project that calculates the total of fat, carbohydrate and protein. Allow the user to enter into text boxes. The grams of fat, grams of carbohydrate and grams of protein. Each gram of fat is 9 calories and protein or carbohydrate is 4 calories. Display the total calories of the current food item in a label. Use to other labels to display and accumulated some of calories and the count of items entered. The form food have 3 text boxes for the user to enter the grams for each category include label next to each text box indicating what the user is entering.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

INTRODUCTION TO OPEN SOURCE TECHNOLOGIES (PHP, Mysql) LAB

Course Code	Credit Units	Semester
BCI 442	01	4

CLO1: Learn how to create an interactive website, allowing visitors to post and retrieve information provided by you or your site's visitors. In this online course, you'll see how to create dynamic web pages using the PHP programming language and the MySQL database server.
CLO2: During the course, you'll walk through the development of a complete content management system web application. You'll receive clear, step-by-step, instructions demonstrating how to create a complete website capable of dynamically displaying data from a MySQL database.
CLO3: You'll discover how you can allow your site's visitors to add new information to an online database, search through posted data, and create meaningful printed reports. By the end of this course, you'll have plenty of useful code templates that will help you create your very own dynamic, web-based, content management system.

Course Contents:

1. Write the process of installation of web server.
2. Write programs to print all details of your php sever. Use phpinfo().
3. Write a program to give demo of ECHO and PRINT command.
4. Write a program sort ten number by using array.
5. Create a database in Mysql and connect that database from PHP.
6. Write a program to Update, insert and delete the values of table in Question No – 9 database.

Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

INTRODUCING ROUTING AND SWITCHING IN THE ENTERPRISE LAB

Course Code	Credit Units	Semester
BCI 443	**01**	**4**

CLO1: This course familiarizes students with the equipment applications and protocols installed in enterprise networks, with a focus on switched networks, IP Telephony requirements, and security. It also introduces advanced routing protocols such as Enhanced Interior
CLO2: Gateway Routing Protocol (EIGRP) and Open Shortest Path First (OSPF) Protocol. Hands-on exercises include configuration, installation, and troubleshooting.

Course Contents:

1. Application of Cisco Router and Switches in Enterprise Network with example design.
2. Enterprise level Switching techniques.
3. Creating LAN with swich and preventing loops with example.
4. Creating ,Managing and deleting different VLAN.
5. Creating Trunking and Intr-VLAN Routing.
6. Use of VLSM and CIDR for Hierarchical IP Network Address Scheme with some example scenario.
7. Configuration of NAT and PAT in router.
8. Configuring router with RIP Protocol.
9. Configuring router with EIGRP Protocol.
10. Configuration of ACL in router and use of Wildcard Mask.
11. Configuring router as gateway for traffic filtering with example scenario.
12. Troubleshooting Switching, Routing, WAN and ACL issues.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

CLOUD COMPUTING LAB

Course Code	Credit Units	Semester
BCA 444	**01**	**4**

CLO1. Able to understand various cloud computing concepts and their issues.
CLO2. To have practical hands on experience on various cloud technologies.
CLO3. Apply his/her knowledge in new areas within field of basic and advanced cloud computing.
CLO4. Develop independently relevant applications using self-logic in the field cloud computing. These methods include deploying clouds, handling security issues, etc

1. Installation and configuration of Oracle Virtual Box for Windows XP and Andriod.

1. Installation Configuration of Hadoop.
2. Using Hadoop for counting word frequency with map reduce.
3. Cloud Security Management.
4. Performance evaluation of services over cloud – Google App & Amazon web service.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

BIG DATA ANALYTICS LAB

Course Code	Credit Units	Semester
BCA 445	**01**	**4**

CLO1: Understand the Big Data Platform and its Use cases
CLO2: Provide an overview of Apache Hadoop
CLO3: Provide HDFS Concepts and Interfacing with HDFS
CLO4: Understand Map Reduce Jobs
CLO5: Provide hands on Hodoop Eco System
CLO6: Apply analytics on Structured, Unstructured Data. Exposure to Data Analytics with R

1. Implement the following Data structures in Java
   a)Linked Lists
   b) Stacks
   c) Queues
   d) Set
   e) Map

2. Perform setting up and Installing Hadoop in its three operating modes: Standalone• Pseudo distributed• fully distribute.
Use web based tools to monitor your Hadoop setup.

3. Implement the following file management tasks in Hadoop: Adding files and directories• Retrieving files• Deleting files

4. Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm.

5. Write a Map Reduce program that mines weather data.

6. Implement Matrix Multiplication with Hadoop Map Reduce.

7. Install and Run Pig then write Pig Latin scripts to sort, group, join, project, and filter your data.

8. Install and Run Hive then use Hive to create, alter, and drop databases, tables, views, functions, and indexes.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

MINOR PROJECT

Course Code	Credit Units	Semester
BCI 450	03	4

CO1. Identify the proposed problem
CO2. Develop a functional application based on the software design
CO3. Apply to code, debugging, and testing tools for implementation
CO4. Prepare the proper documentation for report writing and oral presentation.

GUIDELINES FOR PROJECT FILE

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation.

Research is genuine exploration of the unknown that leads to new knowledge, which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals.
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

Report Layout

The report should contain the following components

1. File should be in the following specification

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components

Front Page
Table of Contents
Acknowledgement
Student Certificate

Company Profile
Introduction
Chapters
Appendices
References / Bibliography

- **Title or Cover Page or Front Page**

The title page should contain the following information: Project Title; Student's Name; Course; Year; Supervisor's Name.

- **Table of Contents**

Titles and subtitles are to correspond exactly with those in the text.

- **Acknowledgement**

Acknowledgment to any advisory or financial assistance received in the course of work may be given.

- **Student Certificate**

Given by the Institute.

- **Company Certificate & Profile**

This is a certificate, which the company gives to the students. A Company Profile corresponds to a file with company-specific data. Company data can be stored there and included in a booking when needed.

- **Introduction**

Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

- **Chapters**

All chapters and sections must be appropriately numbered, titled and should neither be too long nor too short in length. The first chapter should be introductory in nature and should outline the background of the project, the problem being solved, the importance, other related works and literature survey. The other chapters would form the body of the report. The last chapter should be concluding in nature and should also discuss the future prospect of the project.

- **Appendices**

The Appendix contains material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

- **References / Bibliography**

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project. Project execution is concerned with assessing how much work has been put in.
The File should fulfill the following ***assessment objectives:***

1. Writing a critical literature review

- Search for literature
- Summarizing and presenting the literature
- Evaluating key content and theories

2. Collecting and analyzing research material
    - Choosing and designing research method
    - Conducting the research
    - Analyzing, sorting and classifying the data to make decision
3. Interpreting research method and draw conclusion
    - Findings
    - Recommendation
4. Assigning the theories and writing the project report
    - Structuring the project in accordance with the given style
5. Bibliography
    - This refer to the books, Journals and other documents consulting while working on the project

Examination Scheme:

Components	**MRP**	**V**	**S**	**FP**	**R**
Weightage (%)	20	20	20	20	20

MRP – Mid Report Presentation, V – Viva, S – Synopsis, FP – Final Presentation, R - Report

Anandam

Course Code	L		T	P	Credit	Semester
AND004	2		0	0	2	IV

Course Learning Outcome:

CLO1: Awareness and empathy regarding community issues
CLO2: Interaction with the community and impact on society
CLO3: Interaction with mentor and development of Student teacher relationship
CLO4: Interaction among students, enlarge social network
CLO5: Cooperative and Communication skills and leadership qualities Critical thinking, Confidence and Efficiency

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants, phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.
- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.
3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.

5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
6. For the topic chosen by the group, students are recommended to cover the following points:
    a) Current scenario (Regional, national and international level as applicable)
    b) Future predictions
    c) Duty of the government
    d) Government policies (related to the topic), if any
    e) Duty of public
    f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
3. Conclusion is clearly stated. The underlying logic is explicit.

OPEN ELECTIVE
COMMUNICATION SKILLS - II

Course Code	Credit Units	Semester
BCS 401	**01**	**4**

A. COURSE LEARNING OUTCOMES (CLO)

CLO 1	Identify steps to professional communication
CLO 2	Identify the key components of meeting, agendas and meeting minutes

CLO 3	Understand the key skills and behaviors required to facilitate a group discussion/presentation
CLO 4	Polish current affairs & rapport building

B. SYLLABUS

Topic
Enhancing Speaking Skills (Public Speaking)
Resume Building-1
GD-2 (Specifically: Social & Political)
Presentations-2

EXAMINATION SCHEME:

Components	Public Speaking	GD	Poster Presentation	Attendance
Weightage (%)	30	30	35	5

SUGGESTED READINGS

- Essential Telephoning in English, Garside/Garside, Cambridge
- Working in English, Jones, Cambridge
- Dr. P.Prasad. *Communication Skills*.S.K.Kataria &Sons
- Koneru, Aruna. *Professional Communication.* The McGraw Hill: New Delhi, 2008. Print
- Krishnaswamy N, *Creative English for Communication***.** Delh**i:** Macmillan Publishers India Ltd. Print. 2007.

BEHAVIOURAL SCIENCE - IV
(GROUP DYNAMICS AND TEAM BUILDING)

Course Code	Credit Units	Semester
BSS 403	01	4

Course learning outcomes (CLOs)

At the successful completion of this course you (the student) would be able to:

1. Compare the difference between the groups and teams and their strength and weaknesses. Also, the internal and external factors that affect their functioning.
2. Access when there is a need of group formation and when it is needed to be transformed into team.
3. Identify the characteristics of leaders and the power practiced by them.
4. Apply the type of leadership style power practiced in different situation.

Course Objective:

- To inculcate an elementary level of understanding of group/team functions
- To develop team-spirit and to know the importance of working in teams

Course Contents:

Module I: Group formation
Definition and Characteristics
Importance of groups
Classification of groups
Stages of group formation
Benefits of group formation

Module II: Group Functions
External Conditions affecting group functioning: Authority, Structure, Org. Resources, Organizational policies etc.
Internal conditions affecting group functioning: Roles, Norms, Conformity, Status, Cohesiveness, Size, Inter group conflict.
Group Cohesiveness and Group Conflict
Adjustment in Groups

Module III: Teams
Meaning and nature of teams
External and Internal factors effecting team
Building Effective Teams
Consensus Building
Collaboration

Module IV: Leadership
Meaning, Nature and Functions
Self leadership
Leadership styles in organization
Leadership in Teams

Module V: Power to empower: Individual and Teams
Meaning and Nature
Types of power
Relevance in organization and Society

Examination Scheme:

Components	SAP	JOS	FC/MA/CS/HA	P/V/Q	A
Weightage (%)	25	15	30	25	05

SAP- Social Awareness Programme; **JOS**-Journal of Success; **HA**-Home Assignment; **P**-Presentation; **V**-Viva; **Q**-Quiz; **FC-** Flip class; **MA-** Movie Analysis; **CS-** Case study; **A**-Attendance

Text & References:

- Organizational Behaviour, Davis, K.
- Hoover, Judhith D. Effective Small Group and Team Communication, 2002, Harcourt College Publishers
- Dick, Mc Cann & Margerison, Charles: Team Management, 1992 Edition, viva books
- LaFasto and Larson: When Teams Work Best, 2001, Response Books (Sage), New Delhi
- Smither Robert D.; The Psychology of Work and Human Performance, 1994, Harper Collins College Publishers

FRENCH - IV

Course Code	Credit Units	Semester
FLT 401	02	4

Course Learning Objective:

- Students will hone intermediate language skills such as reading, writing, speaking, listening & interactive) in the language
- Students will be able to read and interpret small texts of intermediate level.
- Students will be able to communicate in small sentences in Simple Future and Past tenses.
- Students will be able to communicate in oral in small sentences in Simple Future and Past tenses. etc.

- To do the shopping
- To ask and express one's needs
- To present one's eating habits
- To understand a label
- To ask the price
- To order at the restaurant
- To organise a meeting
- To propose to someone to do an activity
- To understand the advertisement of a conference
- To understand the names of different stations
- To speak about ones schedule
- To express one's professional wish
- To formulate a project
- To read a notice board

Course Contents:

Unité 3 La science au quotidien Page : 62-84 Leçons 10, 11 & 12

Contenu Lexical:

1. La nourriture
2. Les ingredients
3. Les expressions de quantité
4. Les expressions familières avec les noms de fruits et les legumes
5. Les expressions pour proposer une invitation
6. Le processus de fabrication de quelques elements
7. Les expressions pour parler d'un projet

Contenu Grammatical:

1. Manger et boire au présent
2. L'articlepartitif
3. Les prépositions de lieu
4. Les verbs pronominaux
5. La date, l'heure et le jour: les prépositions
6. La nominalisation

EXAMINATION SCHEME

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					End Sem Evaluation (Total 50 Marks)
Quiz	**Mid Term Test**	**Presentation**	**Viva Voce**	**Attendance**	**End-Term Exam**
10	**15**	**10**	**10**	**5**	**50**

Text & References:

- Le Gargasson, I. Naik, S. Chaize, C. (2012) Tech French, Delhi : Goyal Publications
- Ray. A, Robert (2010) Le Petit Robert French Dicitionary, Paris: Le Robert
- Robert, Collins (2006) Collins Robert French Dictionary, Paris : Harper Collins

GERMAN - IV

Course Code	Credit Units	Semester
FLG 401	02	4

Course Learning Objective:

- Students will hone intermediate language skills such as reading, writing, speaking, listening & interactive) in the language
- Students will be able to read and interpret small texts of intermediate level.
- Students will be able to communicate in small sentences in Simple Future and Past tenses.
- Students will be able to communicate in oral in small sentences in Simple Future and Past tenses. etc.

After successful completion of this semester, students will be able to:

- talk about different professions
- express positive and negative aspect of different professions.
- talk about daily routine of a job
- enquire about direction.
- use preposition in sentences.
- understand the visiting cards etc.

Course Content:

Vocabulary Content:

- Professions
- Workplaces
- Professional Tasks like writing mail, make phone calls etc.
- Locations (right left, etc.)
- Public places

Grammar Content:

- Possessive article in accusative.
- Introducing prepositions in dative, accusativ cases and changing prepositions in dat + acc.
- Usage of preposition : in through, to , at etc

EXAMINATION SCHEME

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					End Sem Evaluation (Total 50 Marks)
Quiz	Mid Term Test	Presentation	Viva Voce	Attendance	End-Term Exam
10	15	10	10	5	50

Prescribed Text-Book: Lessons from 11 onwards from Deutschals Fremdsprache -1B, INBH & Oxford, New Delhi, 1977

References: **Studio D A1** by Hermann Funk, Christina Kuhn and Silke Demme, Cornelsen, 2013

Tangram A1by Rosa Maria Dallapiazza, Eduard von Jan & Till Schoenherr, Max Hueber, 2007

SprachtrainingA1 by Rita Maria Niemann, Dong Ha Kim, Cornelsen, 2013

Dictionaries for reference: **Studio D: Glossar** A1 – Deutsch –Englisch, Cornelsen, 2013

http://www.duden.de/woerterbuch

Materials are given in form of photocopies if felt to be necessary

SPANISH – IV

Course Code	Credit Units	Semester
FLS 401	02	4

Course Learning Objective:

- Students will hone intermediate language skills such as reading, writing, speaking, listening & interactive) in the language
- Students will be able to read and interpret small texts of intermediate level.
- Students will be able to communicate in small sentences in Simple Future and Past tenses.
- Students will be able to communicate in oral in small sentences in Simple Future and Past tenses. etc.
- To talk about relations
- To express obligation
- To enquire about direction
- To be able to describe your locality
- Telephonic conversation etiquettes
- Dialogue between two friends/sales man and client etc.

Course Content:

Vocabulary Content:
Family, friends, directions, way(going straight, left, right etc.) Temple, hospital, restaurant, church, hospital, Town hall, parks, shopping mall, etc.

Grammar Content:
Revision of present indefinite, continuous and near future tense.
Doublenegation – No Nunca, Ningun/a, Nada, nadie etc.
Tener que / Hay que
Expressionswith Tener and Estar.
Use of Apetecer, Llevarse bein o mal con alguien / Caer +bien/mal + a alguien

Examination Scheme

ExaminationScheme:

Total: 100 marks

ContinuousEvaluation (Total 50 Marks)					EndSemEvaluation (Total 50 Marks)
Quiz	MidTerm Test	Presentation	Viva Voce	Attendance	End-TermExam
10	15	10	10	5	50

Skills Evaluated: Writing, Comprehension, grammar, and Vocabulary

Text & References:
Nuevo Español Sin Fronteras (ESF1) by Jesús sánchez Lobato, Concha Moreno Garcia, Concha Moreno Garcia, Isabel Santos Gargallo, Sociedad General Española De Librería, S.A 2005
Pasaporte Nivel (A1) byMatideCerraloza Aragón, oscarCerraloza Gilli, Begoña Llovet Barquero, EdelsaGroup didascalia, S.A. 2005
Dictionaries for reference: Collins, www.wordreferences.com.
Essential materials are given in the form of photocopies.

CHINESE – IV

Course Code	Credit Units	Semester
FLC 401	**02**	**4**

Course Learning Objectives:

- Students will hone intermediate language skills such as reading, writing, speaking, listening & interactive) in the language
- Students will be able to read and interpret small texts of intermediate level.
- Students will be able to communicate in small sentences in Simple Future and Past tenses.
- Students will be able to communicate in oral in small sentences in Simple Future and Past tenses. etc.

On the completion of Fourth semester the students will be able to consolidate their proficiency of HSK-I and will be able to

- Read Chinese words, phrases and simple sentences both in Pin Yin and Characters given in the text.
- Write Chinese Characters, sentences and small paragraphs.
- Speak Chinese dialogues from various fields of day to day life.
- Listen and understand simple Chinese words and dialogues used in syllabi.
- Carry out conversation in the target language.
- Manipulate basic grammatical structures such as: 疑问代词.etc.
- Master and use most essential vocabulary items of day to day use and office related vocabulary; approx 70 Characters including 50 characters of HSK level –II
- Refer Chinese dictionaries.
- Translate a Chinese paragraph with the help of dictionaries and translation software.

COURSE CONTENTS

1. Revision of Important expressions
2. Expression of welcome
3. Expression of time: past, present & future
4. Expression of right or wrong.
5. Questioning and answering simple questions about medical care
6. Questioning and answering simple questions about sports & entertainment
7. Office related vocabulary , expressions & email writing
8. Referring Chinese dictionaries (hard and electronic dictionaries)
9. Translation with the help of dictionaries & translation software
10. Practice of model test series of HSK-I
11. CBT package
12. Listening
13. Conversation based on above topics
14. Chinese poetry

VOCABULARY CONTENT

1. Vocabulary will include approx 70 Characters including 50 Characters of HSK-II level.

1. Vocab related to welcome, tenses, right wrong etc and office related vocabulary will be covered during this semester.

GRAMMATICAL CONTENT

1. Interrogative pronouns 疑问代词: 什么，哪儿，谁，为什么， 怎么样， 哪，什么时候，多少，几，

2。Money 表示钱数

3. Weight 表示重量

4. Measure words量词

5. Adverbs 副词

6. 时间副词：正在

7. 频率副词：再

EXAMINATION SCHEME

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					End Sem Evaluation (Total 50 Marks)
Quiz	**Mid Term Test**	**Presentation**	**Viva Voce**	**Attendance**	**End-Term Exam**
10	**15**	**10**	**10**	**5**	**50**

Text books & References

1. Learn Chinese with me book-II. (Major Text Book)

2. Module on HSK-II. (suggested reading)

3. Practical Chinese Grammar for foreigners. (suggested reading)

4. Chinese Dictionaries: Chinese to English & English to Chinese. (reference books)

5. Office Talk (suggested reading)

SYSTEM SOFTWARE

Course Code	Credit Units	Semester
BCA 501	03	5

CLO1 The Student will know the Fundamentals of System software.
CLO2 The Student has been able to understand about Machine instructions.
CLO3 The Student will know the usage of Assemblers.
CLO4 The Student has been able to understand about compilers.
CLO5 The Student has been able to understood how to link a program through linkers and how to load a program to loaders
CLO6 The Student will learn about MS-Dos compiler as well as the debugging process.
CLO7 The Student is aware about various types of operating systems.

Course Contents:

Module I

System Software and Machine Architecture, Evolution of the components of a programming System-Assemblers, Loaders, Macros, Compilers and Formal Systems.

Assemblers-basic assembler functions, Machine-Dependent Assembler Functions, Machine-Independent Assembler Functions, Design of Two Pass Assembler. Implementation Examples-SPARC.

Module II

Macros & Macro Processors-Macro Instructions, Macro calls and Expansion, Machine-Independent Macro Processor Features, Macro Processor Design Options, Implementation-A two pass algorithm, Implementation Examples-ANSI C Macro Processor

Module III

Loaders & Linkers, Basic Loader Functions, Machine-Dependent Loader Features, Machine-Independent Loader Features, Compile & Go-Loaders, General Loader Scheme, Absolute Loaders, Self- Relocating Loaders, Direct-Linking Loaders, Binders, Overlays, Dynamic Linking, Bootstrap Loaders, Design of Direct Linking Loader, Implementation Examples-MS-DOS Linker.

Module IV

Compilers, Basic Compiler Functions, Machine-Dependent Compiler Features, Machine-Independent Features, Compiler Design Options-Division into passes, Interpreters, P-code Compilers, Compilers-Compilers, Implementation Example-YACC Compiler-Compiler.

Module V

Basic Operating System Functions, Machine-Dependent Operating System Features, Machine-Independent Operating System Features, Types of Operating System, Implementation Example-Unix.

Software Tools for Program Development, Editors, Debug Monitors, User Interfaces, and Database Management Systems-basic concepts, levels of data description, use of DBMS.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

***Text*:**

- Leland L. Beck, System Software-An Introduction to Systems Programming, Addison Wesley.

References:

- D.M. Dhamdhere,, Systems Programming & Operating Systems, Mc Graw Hill
- John J. Donovan, Systems Programming, Mc Graw Hill.

JAVA PROGRAMMING

Course Code	Credit Units	Semester
BCI 502	**03**	**5**

CLO1: Read and understand Java-based software code of medium-to-high complexity.
CLO2: Use standard and third party Java's API's when writing applications.
CLO3: Understand the basic principles of creating Java applications with graphical user interface (GUI).
CLO4: Understand the fundamental concepts of computer science: structure of the
CLO5: computational process, algorithms and complexity of computation.
CLO6: Understand the basic approaches to the design of software applications.
CLO7: Apply the above to design, implement, appropriately document and test a Java application of medium complexity, consisting of multiple classes.

Course Contents:

Module I: Introduction

Concepts of OOP, Features of Java, How Java is different from C++, Data types, Control Statements, identifiers, arrays, operators. Variables, Applications and Applets

Module II: Java Programming

Classes and methods,Constructor ,Types of constructor, method overloading

Inheritance: Single Inheritance , Multilevel hierarchy, method overriding, Abstract classes, Interface, Final classes, Garbage Collection, String classess

Module III: AWT and Event Handling

Introduction to AWT, Layout Manager, Event handling Mechanism, Event Model, Event Classes, Sources of Events, Event Listener Interfaces

AWT: Working with Windows, AWT Controls

Html basic tags, Applet Classes, Graphics,

Module IV: Exception Handling and Multithreading

Exception handling, fundamentals exception types, uncaught exceptions, throws, throw, try and catch, final, built in exception, creating your own exception

Multithreading fundaments, Creating, Implementing and Extending thread, thread priorities, synchronization suspending, resuming and stopping Threads

Module V: Java Packages

Package creation, Additional Packages, Input Output Exploring java.io, Swing classes and controls, Advantages of Swing over AWT.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Naughton, Schidt "The Complete Reference JAVA 2 " TMH

References:

- Balaguruswamy "Programming in JAVA"
- Comer "Computer Networks & Internet"
- Deitel & Deitel "Java™ How to Program, 6/E**"**
- Frouzan "Data communications and Networking"
- Gary Cornell "Core Java" The Sun Micro Systems Series

UNIX OPERATING SYSTEM AND SHELL PROGRAMMING

Course Code	Credit Units	Semester
BCI 503	**03**	**5**

CLO1: Identify the UNIX file system and its advantages.
CLO2: Describe the essential UNIX commands and shell programming.
CLO3: Apply and compare UNIX administration commands for privilege distribution.
CLO4: Implement different types of shell scripting programming.

Course Contents:

Module I: Overview
UNIX Overview, UNIX System Organization, Kernel , Running a Command: the Shell, Files and Directories, Peripheral Devices and UNIX: Special Files.

Module II: UNIX Commands & UNIX Editors
Login, password, hostname; creating an account; Virtual consoles; shell and commands; logout; changing password; Files and Directories; pathname; Directory Tree; current working directory; relative pathname; referring to home directories; Commands to move around; creating new directories; copying files; moving files; Deleting files and directories; looking at files: cat, more; Getting online help; manual pages. Wildcards; hidden files; Standard input and output; redirecting input and output; filter; pipes; file permissions; user and group; Interpreting file permissions; Permission Dependencies; Changing permissions. Managing file links; hard links; symbolic links; jobs and process: process ID; Job control; foreground and background jobs; suspend and interrupt a process; Back grounding and killing jobs; stopping and restarting jobs.

Vi Editor
Command mode, insert mode and last line mode; command to delete character, insert line; deleting text, command for moving the cursor; including other files; running shell commands; getting vi help; search and replace commands; changing and deleting text, Change word, Change line, Delete current line, Delete n lines, Delete remainder of Lines; copying and moving; Saving and Exiting.

Module III: File System
UNIX File System, File Permissions, System Calls and Library Functions

Module IV: UNIX Shell Programming
Interactive Shell Scripts, Shell Variables and Keywords, Positional Parameters and Command Line Arguments, Arithmetic in Shell Scripts, Taking Decisions, Loop Control Structure, Shell Metacharacters

Module V: System Administration
Adding and Removing Users, Starting up and Shutting down the System, Disk Management, File System Mounting and Unmounting, Monitoring System Usage, Ensuring System Security

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

***Text*:**

- Maurice J. Bach, “Design of the Unix operating System” PHI.
- Prata. “Advanced UNIX-A Programmers Guide” BPB
- Kanetkar. “UNIX Shell Programming” BPB

References:

- Sumitabha Das, “UNIX: Concepts and Application”, TMH.
- Das. “UNIX- Concepts & Applications

JAVA PROGRAMMING LAB

Course Code	Credit Units	Semester
BCI 522	01	5

CLO1: Identify the core concepts of Information Technology, both theoretical and applied.
CLO2: Investigate new technologies, tools, practices and standards, and relate to their knowledge domain.
CLO3: Acquaint with design and development tools, and engage in systematic evaluation using current methodologies.
CLO4: Demonstrate the ability to integrate IT knowledge and develop industry oriented projects.

PART-I

List of JAVA Programme

1. Create a "Hello, World" program that simply prints out that statement.
2. Write a program that prints three arguments taken from the command line.
3. Write a program that prints values from 1 to 100.
4. Create a class with a default constructor (one that takes no arguments) that prints a message. Create an object of this class.
5. Write Java assignment statements to evaluate the following equations:
   (i) Energy = mass(acceleration*height+(velocity)sqr(2)/2)
   (ii) Torque = 2m1m2/m1+m2 * g
6. Design and write a Java program to define a class called Rectangle that contains members for representing its length and breadth. Provide members to get and set these attributes.
7. Design a class to represent a bank account. Include the following members:
   Data members:
   Name of the depositor
   Account number
   Type of account
   Balance amount in the account
   Methods:
   To assign initial values
   To deposit an amount
   To withdraw an amount after checking balance
   To display the name and balance
8. Write simple program to calculate the sum of digits of any number.
9. Write a simple program to display a "*" I triangle shape.
   Output will be like this

```
    *
   * * *
  * * * * *
```

10. Write a simple program to call a method called simple from a main function. The method simple should accept an integer as an argument and calculate the square of the number in the method simple.
11. Write a Java program to add two integers and two float numbers. When no arguments are supplied, give a default value to calculate the sum. Use method overloading to achieve this.
12. Write a program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Create another class called MultDiv that extends from AddSub class to use the member data of the superclass. MultDiv should have methods to multiply and divide. A main method should access the method and perform the mathematical operations.
13. Write an interface with a method called display. Implement this method I a class to display two names.
14. Write an interface that has two methods called push and pop of a stack. Write a class to implement the two methods for a fixed size stack creation.
15. Write a small program to catch Negative Array Size Exception. This exception is caused when the array is initialized to negative values.

16. Write a program to handle Null Pointer Exception and use the finally clause to display a message to the user.
17. Write a Java program that takes a string and converts it into uppercase and lowercase letters.
18. Write a Java program to find the volume of a sphere and a cone.
19. Write a Java program to convert rupees to dollars.
20. Write a Java program to find x to the power y. Use overloading for different cases when x and y are combinations of integer and floating point numbers.
21. Create an abstract class called Figure that has an abstract method called draw (). Make the subclasses called Filled_Rectangle, Filled_Arc and override the draw method in which you would print the message regarding the current object.
22. Write a Java program that has integer variables a, b, c and result as float. Store some values in them and apply the formula result = a/(b-c). Catch the probable exception.

23. Write a Java program that accepts two strings as command line arguments. It checks for the number of command line arguments. If they are less or more it throws an exception giving an appropriate message.
24. Write applets to draw the following shapes:
    (i) Cone
    (ii) Cylinder
    (iii) Cube
    (iv) Square inside a circle
    (v) Circle inside a square
25. Write an applet to display the following figure:
26. Write an applet to display a face.
27. Write an applet to display five buttons.
28. Write an applet to illustrate BorderLayout.
29. Write a Java program to create 5 threads by extending Thread class.
30. Write a Java program to create 5 threads by implementing Runnable interface.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

UNIX OPERATING SYSTEM AND SHELL PLROGRAMMING LAB

Course Code	Credit Units	Semester
BCI 523	01	5

CLO1: Identify the UNIX file system and its advantages.
CLO2. Describe the essential UNIX commands and shell programming.
CLO3. Apply and compare UNIX administration commands for privilege distribution.
CLO4. Implement different types of shell scripting programming.

Unix Programmes

1. Write a Shell Script that takes a search string and filename from the terminal & displays the results.

2. Write a Shell Script that takes pattern and filename as command line arguments and displays the results appropriately i.e. pattern found/pattern not found.

3. Write a Shell Script that accepts only three arguments from the command line. The first argument is the pattern string, the second argument is the filename in which the pattern is to be searches and the third argument is the filename in which the result is to be stored.

4. Write a Shell Script that accepts a filename as a command line argument and finds out if its a regular file or a directory. If its a regular file, then performs various tests to see if it is readable, writeable, executable etc.

5. Write a Shell Script which creates the following menu and prompts for choice from user and runs the chosen command.

    Today's date

    Process of user

    List of files

    Quit to UNIX

6. Write a Shell Script that computes the factorial of a given number

7. Write a Shell Script that works like a calendar reminding the user of certain things depending on the day of the week.

8. Write a Shell Script that changes the extension of a group of files from txt to doc

9. Write a Shell Script that accepts both filename and a set of patterns as positional parameters to a script.

10. Write a Shell Script which will redirect the output of the date command without the time into a file.

11. Write a Shell Script (using while loop) to execute endlessly (until terminated by user) a loop which displays contents of current directory, disk space status, sleep for 30 seconds and display the users currently logged in on the screen.

12. Write a Shell Script that receives two filenames as arguments. It should check whether content of the two files is same or not. If they are same, second file should be deleted.

13. If a number is input through the keyboard, WASS to calculate sum of its digits.

14. Write a Shell Script that performs a count-down either from 10 (default) or from the value that is

entered by the user.

15. Write a Shell Script which takes a command line argument of Kms and by default converts that number into meters. Also provide options to convert km to dm and km to cm.
16. Write a Shell Script using for loop, which displays the message "Welcome to the UNIX System"
17. Write a Shell Script to change the filename of all files in a directory from lower-case to upper-case.
18. Write a Shell Script that examines each file in the current directory. Files whose names end in **old** are moved to a directory named **old files** and files whose names end in **.c** are moved to directory named **cprograms.**
19. Write a Shell Script which searches all files in the given directory (to be taken as command line argument) for the file having the title (to be taken as command line argument), as the first line in the file.

    a) Display the contents of the searched file.

    b) In the end, printthe the file is ###, where

    ### is small-sized if total no. of lines is <50

    ### is medium-sized if total no. of lines between 50&100

    ### is large-sized.
20. Write a shell script which reports names and sizes of all files in a directory (directory would be supplied as an argument to the shell script) whose size is exceeding 1000 bytes. The filenames should be printed in descending order of their sizes. The total number of such files should also be reported.
21. WASS for renaming each file in the directory such that it will have the current shell PID as an extension. The shell script should ensure that the directories do not get renamed.
22. WAP to calculate and print the first ***m*** Fibonacci numbers.
23. WASS that will receive any number of filenames as arguments. The shell script should check whether such files already exist. If they do, then it should be reported. The files that do not exist should be created in a sub-directory called **mydir**. The shell script should first check whether the sub-directory **mydir** exists in the current directory. If it doesn't exist, then it should be created. If **mydir** already exists, then it should be reported along with the number of files that are currently present in **mydir**.
24. A shell script receives even number of filenames. Suppose four filenames are supplied, then the first file should get copied into second file, the third file should get copied into fourth and so on. If odd number of filenames is supplied then no copying should take place and an error message should be displayed.
25. WASS to identify all zero-byte files in the current directory and delete them. Before proceeding with deletion, the shell script should get a conformation from the user.
26. WASS to compute the **GCD** and **LCM** of two numbers.
27. Two numbers are entered through the keyboard. WAP to find the value of one number raised to the power of another.
28. WASS that prompts the user for the password. The user has maximum of 3 attempts. If the user enters the correct password, the message "Correct Password" is displayed else the message "Wrong Password".

29. WASS that repeatedly asks the user repeatedly for the "Name of the Institution" until the user gives the correct answer.
30. WAP to generate all combinations of 1, 2 and 3 using **for loop.**

Examination Scheme:

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

DOMAIN ELECTIVE
DESIGNING AND SUPPORTING COMPUTER NETWORK

Course Code	Credit Units	Semester
BCI 531	**03**	**5**

CLO1: Learning about computer network organization and implementation.
CLO2: Planning for the implementation of a computer network infrastructure.
CLO3: Understanding the role of network designers, engineers, IT administrators and other related staff.
CLO4: Performing maintenance and support of network infrastructure.

Course Contents:

Module I: Introducing Network Design Concepts
Discovering Network Design Basics, Investigating Core Layer Design Considerations
Investigating Distribution Layer Consideration, Investigating Access Layer Design Considerations, Investigating Server Farms and Security, Investigating Wireless Network Considerations, Supporting WANs and Remote Workers

Module II: Gathering Network Requirements
Introducing Cisco Lifecycle Services, Explaining the Sales Process, Preparing for the Design Process, Identifying Technical Requirements and Constraints, Identifying Manageability Design Considerations

Module III: Characterizing the Existing Network
Documenting the Existing Network, Updating the Existing Cisco IOS, Upgrading Existing Hardware, Performing a Wireless Site Survey, Documenting Network Design Requirements

Module IV: Identifying Application Impacts on Network Design
Characterizing Network Applications, Explaining Common Network Applications
Introducing Quality of Service (QoS), Examining Voice and Video Options, Documenting Applications and Traffic Flows

Module V: Creating the Network Design
Analyzing the Requirements, Selecting the Appropriate LAN Topology, Designing the WAN and Remote Worker Support, Designing Wireless Networks, Incorporating Security

Module VI: Using IP Addressing in the Network Design
Creating an Appropriate IP Addressing Design, Creating the IP Address and Naming Scheme, Describing IPv4 and and IPv6

Module VII: Prototyping the Campus Network
Building a Prototype to Validate a Design, Prototyping the LAN, Prototyping the Server Farm

Module VIII: Prototyping the WAN
Prototyping Remote Connectivity, Prototyping WAN Connectivity, Prototyping Remote Worker Support

Module IX: Preparing the Proposal
Assembling the Existing Proposal Information, Developing the Implementation Plan
Planning for the Installation, Creating and Presenting the Proposal

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- CCNA-Discovery 4.0, module 4, Cisco Certified Networking Academy

References:

- Data Communication and Computer Network, Forozoun, TMH Publication
- Data Communication and Network, Stallings, PHI
- Computer Network, Tanenbaum, PHI

DATA WAREHOUSING & DATA MINING

Course Code	Credit Units	Semester
BCI 532	**03**	**5**

CLO1: Understand what data mining is and how data mining can be employed and applied to solve real problems.
CLO2: Recognize wither a data mining solution is feasible alternative for a specific problem.
CLO3: Apply basic statistical to evaluate the results of data mining models.
CLO4: Develop a comprehensive understanding of how several data mining techniques can be applied to solve problems.
CLO5: Understand the common designs and structures of warehouse systems.

Course Contents:

Module I: Data Warehousing

Introduction to Data Warehouse, its competitive advantage, Data warehouse Vs Operational Data, Things to consider while building Data Warehouse

Module II: Implementation

Building Data warehousing team, Defining data warehousing project, data warehousing project management, Project estimation for data warehousing, Data warehousing project implementation

Module III: Techniques

Bitmapped indexes, Star queries, Read only table spaces, Parallel Processing, Partition views, Optimizing extraction process

Module IV: Data Mining

Introduction to Data Mining, benefits of Data Mining, How it helps in decision making, Data mining techniques, Introduction to Data Mart, Data Mart Tools, Data warehouse vs Data Mart, OLAP and its need, MOLAP and ROLAP

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- Data Warehousing in the real world, Sam Anchory and Dennis Murray

References:

- Data Mining, Pieter Adrians and Doif Zantinge

ANDROID PROGRAMMING

Course Code	Credit Units	Semester
BCI 533	**03**	**5**

CLO1: Read and understand Java and Kotlin based software code of medium-to-high complexity.
CLO2: Understand the basic principles of creating Android applications with graphical user interface (GUI).
CLO3: Apply the above to design, implement, appropriately document and test an Android application of medium complexity, consisting of multiple activities.
CLO4: Understand activity life cycle, intents and services, UI elements and understand the principles of developing nice user interface.
CLO5: Understand and use Storage in Android, SQLite, build android apps using media and location services.

Course Contents

Module –I: Introduction

Setting up development environment, Dalvik Virtual Machine & .apk file extension, Fundamentals, Basic Building blocks - Activities, Services, Broadcast Receivers & Content providers, UI Components - Views & notifications, Components for communication -Intents & Intent, Filters, Android API levels (versions & version names)

Module –II: Android Structure

AndroidManifest.xml, Uses-permission & uses-sdk, Resources & R.java, Assets, Layouts & Drawable Resources, Activities and Activity lifecycle, First sample Application.

Module –III: Emulator – Android Virtual Machine

Launching emulator, Editing emulator settings, Emulator shortcuts, Logcat usage, Introduction to DDMS, Hello World App, Creating your first project, The manifest file, Layout resource, Running your app on Emulator, Second App:- (switching between activities),- Develop an app for demonstrating the, communication between Intents, Explicit Intents, Implicit intents

Module –IV: UI design

Time and Date, Images and media, Composite, Alert Dialogs & Toast, Popup, Examples, Option menu, Context menu, Sub menu, menu from xml, menu via code, Examples

Module –V: Adapters and Widgtes

Adapters:-Array Adapters. Base Adapters, ListView and List Activity, Custom listview, Grid View using adapters, Gallery using adapters

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & Reference:

- Android Programming: The Big Nerd Ranch Guide (Big Nerd Ranch Guides) (By: Bill Philips & Brian Hardy
- Android Recipes: A Problem-Solution Approach, Dave Smith & Jeff Friesen

WEB PROGRAMMING

Course Code	Credit Units	Semester
BCI 534	**03**	**5**

CLO1: To learn HTML tags and JavaScript Language programming concepts and techniques.
CLO2: To learn to write, test, and debug web pages using HTML, Advanced CSS and JavaScript.
CLO3: TO Learn the basics of creating XML documents, transforming XML documents, and validating XML documents.
CLO4: Learn how AJAX works and JQuery works and how these concepts and tools can be used to communicate with a web server.

Course Contents:

Module I: Introduction to Web Programming

Basic Terminology used in Web programming, Various Web Programming Languages and Tools used with their features and properties, static versus dynamic programming, role of backend (database) in web programming with their features, Security issues in web programming

Module II: Introduction to JavaScript

What is JavaScript, Output, Statements, Syntax, Comments, Variables, Operators, Arithmetic, Assignment, Data Types, Functions, Objects, Events, String and Its Methods, Numbers and Its Methods, Array and Its Methods, Sort, Iteration, Date and Its Methods, Condition, Switch, Loops, User Defined Functions, JS Forms, Form Control Validations, Advanced JavaScript: getElementById and innerHTML.

Module III: Advanced CSS

Box Model, Rounder Corners, Border Images, Backgrounds, Colors, Gradients, Shadow, Text Effects, 2D Transform, 3D Transform, Transition, Animations

Module IV: Introduction to XML

What is XML, How to Use XML, Tree, Syntax, Elements, Attributes, Namespaces, Display, HTTPRequest, Parser, DOM, XPath, XSLT, XQuery, XLink, Validator, DTD, Schema, Server

Module V: Introduction to AJAX and JQuery

Introduction AJAX, XMLHttp, Request, Response, XML file, PHP, Database, Applications, Introduction to JQuery, Syntax, Selectors, Events, Effects, JQuery AJAX Introduction, JQuery Load, JQuery Get/Post.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Harvey & Paul Deitel & Associates, Harvey Deitel and Abbey Deitel, “Internet and World Wide Web - How To Program”, Fifth Edition, Pearson Education, 2011.
- Achyut S Godbole and Atul Kahate, “Web Technologies”, Second Edition, Tata McGraw Hill, 2012.

- Thomas A Powell, Fritz Schneider, “JavaScript: The Complete Reference”, Third Edition, Tata McGraw Hill, 2013.
- David Flanagan, “JavaScript: The Definitive Guide, Sixth Edition”, O'Reilly Media, 2011

DESIGNING AND SUPPORTING COMPUTER NETWORK LAB

Course Code	Credit Units	Semester
BCI 541	**03**	**5**

CLO1: Introducing Network Design Concepts, Gathering Network Requirements, and Characterizing the Existing Network.
CLO2: Identifying Application Impacts on Network Design.
CLO3: Creating the Network Design, Using IP Addressing in the Network Design, and Prototyping the Campus Network.
CLO4: Prototyping the WAN and Preparing the Proposal.

Course Contents:

1. Process of Core Layer Design Consideration
2. Process of Access Layer Design Consideration
3. Preparing the Design Process, technical requirements.
4. Documentation Design of Existing Network in the Enterprise.
5. Document tation Design of Network Design Requirements.
6. Documenting application and traffic flow in Enterptrise network.
7. Selection of the Appropriate LAN Topology
8. Designing WAN and Wireless Network and Incorporating Security.
9. Creating an IP addressing Design with example enterprise network.
10. Prototype Design of LAN, Server Farm and WAN Connectivity.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

DATA WAREHOUSING & DATA MINING LAB

Course Code	Credit Units	Semester
BCI 542	03	5

CLO1: visualize, gather information, articulate, analyze, solve complex problems, and make decisions. These are essential to address the challenges of complex and computation intensive problems increasing their productivity.
CLO2: to understand the various kinds of tools.
CLO3: Demonstrate the classification, clustering and etc. in large data sets.
CLO4: Ability to add mining algorithms as a component to the exiting tools.
CLO5: Ability to apply mining techniques for realistic data.

Software Required: Informatica Tool, Cognos, Todd.

List of Programmes:

1. Write a program to implement text mining.
2. Write a program to implement web mining.
3. Write a program to develop snowflake schema.
4. Write a program to develop the tree schema with the help of binary tree.
5. Write a program to implement BFS and DFS with respect to 2-D modeling.
6. Write a program to implement the basic step of informatics tool.

.**Examination Scheme:**

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ANDROID PROGRAMMING LAB

Course Code	Credit Units	Semester
BCI 543	**03**	**5**

CLO1: Read and understand Java and Kotlin based software code of medium-to-high complexity.
CLO2: Understand the basic principles of creating Android applications with graphical user interface (GUI).
CLO3: Apply the above to design, implement, appropriately document and test an Android application of medium complexity, consisting of multiple activities.
CLO4: Understand activity life cycle, intents and services, UI elements and understand the principles of developing nice user interface.
CLO5: Understand and use Storage in Android, SQLite, build android apps using media and location services.

The experiments will be based on the topics covered in the corresponding theory Course.

1. Write a Program to Build a Simple Android Application
2. Java Andorid Program to Demonstrate Usage of String.xml File
3. Java Andorid Program to Demonstrate Activity Life Cycle
4. Write a Program to Change the Background of your Activity
5. Java Andorid Program to Perform all Operations using Calculators
6. Write a Program to Change the Image Displayed on the Screen
7. Write a Program to Create Multiple Activities within an Application
8. Write a Program to Demonstrate Action Button by Implementing on Click Listener
9. Write a Program to Demonstrate the Sound Button Application
10. Write a Program to Demonstrate the use of Scroll View
11. Write a Program to Demonstrate Radio Group Application
12. Write a Program to Demonstrate Alert Dialog Box
13. Write a Program to Set the Wallpaper of Your Device using Bitmap Class
14. Write a Program to Demonstrate the Menu Application
15. Write a Program to Demonstrate Toast in an Application
16. Write a Program for Dividing our Activity into Fully Encapsulated Reusable Components using Fragement
17. Write a Program to Demonstrate List View Activity
18. Write a Program to Draw on a Canvas
19. Write a Program to Demonstrate Count Down Timer Application
20. Write a Program to Demonstrate Layouts in an Activity and Nesting of Layouts
21. Write a Program to Demonstrate Grid View Layout in Android
22. Write a Program to Create Simple Menu in Android
23. Write a Program to Demonstrate Creating an Options Menu in Android
24. Write a Program to Demonstarte Menu Groups in Android
25. Write a Program to Demonstrate Checkable Menu Items in Android

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

WEB PROGRAMMING LAB

Course Code	Credit Units	Semester
BCI 544	**03**	**5**

CLO1: Analyze a web page and identify its elements and attributes.
CLO2: Create web pages using XHTML and Cascading Style Sheets.
CLO3: Build dynamic web pages using JavaScript (Client side programming).
CLO4: Create XML documents and Schemas.
CLO5: Create responsive website using Jquery and AJAX.

Practical 1: Analyze a web page and identify its elements and attributes.

Practical II: Create an HTML Form and Use JavaScript to validate the various controls of the HTML form.

Practical III: Write a JavaScript function that accepts two arguments, a string and a letter and the function will count the number of occurrences of the specified letter within the string.

Practical IV: Write a JavaScript program which compute, the average marks of the following students Then, this average is used to determine the corresponding grade.

Practical V: Create a Web Page to implement the advanced CSS like border, background, colors, gradient, shadow effect, text effect, transitions.

Practical VI: Create an XML file and show its practical implementation considering a real life situation.

Practical VII: Create a simple XML HttpRequest, and retrieve data from a text file.

Practical VIII: Load an XML file with AJAX. Retrieve the contents of an XML file.

Practical IX: Hide all headings on a page when l they are clicked.

Practical X: Using j Query insert some HTML after all paragraphs.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

SUMMER PROJECT – II

Course Code	Credit Units	Semester
BCI 551	03	5

CO1. Identify, Define and justify the scope of the proposed problem CO3. Propose an optimized solution among the existing solutions CO3. Apply to code, debugging, and testing tools for implementation CO4. Prepare the proper documentation for report writing and oral presentation.

They are supposed to follow the following technologies:
Networking
Internet
Java Programming

Guidelines:

There are certain phases of every Intern's professional development that cannot be effectively taught in the academic environment. These facets can only be learned through direct, on-the-job experience working with successful professionals and experts in the field. The internship program can best be described as an attempt to institutionalize efforts to bridge the gap between the professional world and the academic institutions. Entire effort in internship is in terms of extending the program of education and evaluation beyond the classroom of a university or institution. The educational process in the internship course seeks out and focuses attention on many latent attributes, which do not surface in the normal classroom situations. These attributes are intellectual ability, professional judgment and decision-making ability, inter-disciplinary approach, skills for data handling, ability in written and oral presentation, sense of responsibility etc.

In order to achieve these objectives, each student will maintain a file (**Internship File**). The Internship File aims to encourage students to keep a personal record of their learning and achievement throughout the Programme. It can be used as the basis for lifelong learning and for job applications. Items can be drawn from activities completed in the course modules and from the workplace to demonstrate learning and personal development.

The File will assess the student's analytical skills and ability to present supportive evidence, whilst demonstrating understanding of their organization, its needs and their own personal contribution to the organization.

The **layout guidelines** for the Project & Seminar Report

1. File should be in the following specification

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components
Front Page

Table of Content
Acknowledgement
Student Certificate
Company Profile (optional)
Introduction
Main Body
References / Bibliography

The File will include ***five sections*** in the order described below. The content and comprehensiveness of the main body and appendices of the report should include the following:

1. **The Title Page**--Title - An Internship Experience Report For (Your Name), name of internship organization, name of the Supervisor/Guide and his/her designation, date started and completed, and number of credits for which the report is submitted.
2. **Table of Content**--an outline of the contents by topics and subtopics with the page number and location of each section.
3. **Introduction**--short, but should include how and why you obtained the internship experience position and the relationship it has to your professional and career goals.
4. **Main Body**--should include but not be limited to daily tasks performed. Major projects contributed to, dates, hours on task, observations and feelings, meetings attended and their purposes, listing of tools and materials and their suppliers, and photographs if possible of projects, buildings and co-workers.
5. **References / Bibliography** --This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system

ASSESSMENT OF THE INTERNSHIP FILE

The student will be provided with the Student Assessment Record (SAR) to be placed in front of the Internship File. Each item in the SAR is ticked off when it is completed successfully. The faculty will also assess each item as it is completed. The SAR will be signed by the student and by the faculty to indicate that the File is the student's own work. It will also ensure regularity and meeting the delaines.

STUDENT ASSESSMENT RECORD (SAR)

5. Range of Research Methods used to obtain information

6. Execution of Research

7. Data Analysis
- Analyse Quantitative/ Qualitative information
- Control Quality

8. Draw Conclusions

Examination Scheme:

Components	V	S	R	FP
Weightage (%)	20	20	20	40

V – Viva, S – Synopsis, FP – Final Presentation, R - Report

Anandam

Course Code	L	T	P	Credit	Semester
AND005	2	0	0	2	V

Course Learning Outcome:

CLO1: Awareness and empathy regarding community issues
CLO2: Interaction with the community and impact on society
CLO3: Interaction with mentor and development of Student teacher relationship
CLO4: Interaction among students, enlarge social network
CLO5: Cooperative and Communication skills and leadership qualities Critical thinking, Confidence and Efficiency

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants, phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.
- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.
3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.

5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
6. For the topic chosen by the group, students are recommended to cover the following points:
    a) Current scenario (Regional, national and international level as applicable)
    b) Future predictions
    c) Duty of the government
    d) Government policies (related to the topic), if any
    e) Duty of public
    f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
3. Conclusion is clearly stated. The underlying logic is explicit.

OPEN ELECTIVE

COMMUNICATION SKILLS - III

Course Code	Credit Units	Semester
BCS 501	01	5

B. COURSE LEARNING OUTCOMES (CLO)

CLO 1	Create right selection of words and ideas while also choosing the appropriate channel of formal communication.
CLO 2	Demonstrate the ability to analyse a problem and devise a solution in a group.
CLO 3	Demonstrate proficiency in the use of written communication.
CLO 4	Recognize the mannerisms and methodology of Interview and GD to become more expressive in their body language and verbal performance.

B. SYLLABUS

Topic
Email Writing (Briefing, Do's & Don'ts & Practice)
Corporate Dressing & Body Language (Verbal & Non-Verbal Cues & its role in Interview Selection)
Interview-1 (Briefing, Do's & Don'ts, Questions, Mock Sessions)
GD-3(Practice Sessions)

EXAMINATION SCHEME:

Components	Email Writing	GD	Personal Interview	Attendance
Weightage (%)	30	30	35	5

SUGGESTED READINGS

- Essential Telephoning in English, Garside/Garside, Cambridge
- Working in English, Jones, Cambridge
- Dr. P.Prasad. *Communication Skills*.S.K.Kataria&Sons

- Koneru, Aruna. *Professional Communication.* The McGraw Hill: New Delhi, 2008. Print

- Krishnaswamy N,*Creative English for Communication***.** Delh**i:** Macmillan Publishers India Ltd. Print. 2007.

BEHAVIOURAL SCIENCE - V
(INDIVIDUAL, SOCIETY AND NATION)

Course Code	Credit Units	Semester
BSS 503	01	5

Course learning outcomes (CLOs)

At the successful completion of this course you (the student) should be able to:

1. Recognize their personality and individual differences and identify its importance of diversity at workplace and ways to enhance it.
2. Recognize effective socialization strategies and importance of patriotism and taking accountability of integrity.
3. Recognize different types of human rights and its importance.
4. Identify Indian values taught by different religions.
5. Identify long term goals and recognize their talent, strengths and styles to achieve them.

Course Objective:

This course aims at enabling students towards:

- Understand the importance of individual differences
- Better understanding of self in relation to society and nation
- Facilitation for a meaningful existence and adjustment in society
- To inculcate patriotism and National pride.
- To enhance personal and professional excellence

Course Contents:

Module I: Individual differences & Personality
Personality: Definition& Relevance
Importance of nature & nurture in Personality Development
Importance and Recognition of Individual differences in Personality
Accepting and Managing Individual differences (Adjustment Mechanisms)
Intuition, Judgment, Perception & Sensation (MBTI)
BIG5 Factors

Module II: Socialization
Nature of Socialization
Social Interaction
Interaction of Socialization Process
Contributions to Society & Nation

Module III: Patriotism and National Pride
Sense of Pride and Patriotism
Importance of Discipline and hard work
Integrity and accountability

Module IV: Human Rights, Values and Ethics
Meaning of Human Rights
Human Rights Awareness
Importance of human rights

Values and Ethics- Learning based on project work on Scriptures like Ramayana, Mahabharata, Gita etc

Module V: Personal and Professional Excellence

- Personal excellence:
    - Identifying Long-term choices and goals
    - Uncovering talent, strength and style

Alan P. Rossiter's eight aspects of Professional Excellence
Resilience during challenge and loss
Continued Reflection (Placements, Events, Seminars, Conferences, Projects, Extracurricular Activities, etc.)

Examination Scheme:

Components	SAP	JOS	FC/MA/CS/HA	P/V/Q	A
Weightage (%)	25	15	30	25	05

SAP- Social Awareness Programme; **JOS**-Journal of Success; **HA**-Home Assignment; **P**-Presentation; **V**-Viva; **Q**-Quiz; **FC-** Flip class; **MA-** Movie Analysis; **CS-** Case study; **A**-Attendance

Text & References:

- Bates, A. P. and Julian, J.: Sociology - Understanding Social Behaviour
- Dressler, David and Cans, Donald: The Study of Human Interaction
- Lapiere, Richard. T – Social Change
- Rose, G.: Oxford Textbook of Public Health, Vol.4, 1985.
- Robbins O.B.Stephen;. Organizational Behavior

FRENCH - V

Course Code	Credit Units	Semester
FLT 501	02	5

Course Learning Objective:

- Students will hone intermediate language skills such as reading, writing, speaking, listening & interactive) in the language
- Students will be able to read and interpret small texts of intermediate level.
- Students will be able to communicate in small sentences in Simple Future and Past tenses.
- Students will be able to communicate in oral in small sentences in Simple Future and Past tenses. etc.

  - To understand the TP
  - To understand an experiment
  - To read the chemical equations
  - To identify the chemical formulas
  - To understand the instructions of a project
  - To express a desire
  - To understand a testimony
  - To understand and read an exercise of mathematics
  - Read and note the equations

Course Contents:

Unité 4 Formation Scientifique Page : 85-99 Leçons 13, 14 & 15

Contenu Lexical:

1. La chimie: les elements chimique et le matériel
2. La formulation des équationschimiques
3. Le corps humain
4. Les transports encommun
5. Les signes et formulations mathémathiques
6. Les verbes utilisés dans les exercises de mathémathiques

Contenu Grammatical:

1. L'infintif pour exprimer un ordre ou un conseil (dans les consignes)
2. La nominalization
3. Savoir ouconnaître au présent
4. Les pronoms relatives (qui, que, qu')
5. L'infinitif dans les consignes

EXAMINATION SCHEME

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					End Sem Evaluation (Total 50 Marks)
Quiz	**Mid Term Test**	**Presentation**	**Viva Voce**	**Attendance**	**End-Term Exam**
10	**15**	**10**	**10**	**5**	**50**

Text & References:

- Le Gargasson, I. Naik, S. Chaize, C. (2012) Tech French, Delhi : Goyal Publications
- Ray. A, Robert (2010) Le Petit Robert French Dicitionary, Paris: Le Robert
- Robert, Collins (2006) Collins Robert French Dictionary, Paris : Harper Collins

GERMAN - V

Course Code	Credit Units	Semester
FLG 501	02	5

Course Learning Objective:

- Students will hone intermediate language skills such as reading, writing, speaking, listening & interactive) in the language
- Students will be able to read and interpret small texts of intermediate level.
- Students will be able to communicate in small sentences in Simple Future and Past tenses.
- Students will be able to communicate in oral in small sentences in Simple Future and Past tenses. etc.

After successful completion of this semester, students will be able to:

- tell where they work and live
- tell location of their offices and house
- explain, how they reach their work place
- ask and tell the location of thing or person in a house like behind, in front of etc.
- describe the office things like printer, files etc

Course Content:

Vocabulary:

- Workplace
- Location like 1st floor, ground floor.
- Ordinal numbers
- Things and furniture in a office
- Means of transportation

Grammar:

- changing preposition in dative and accusative case
- Verbs related to changing prepositions like to put, to lay etc
- Dative and accusative preposition
- Modal verb : must and can

EXAMINATION SCHEME

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					End Sem Evaluation (Total 50 Marks)
Quiz	Mid Term Test	Presentation	Viva Voce	Attendance	End-Term Exam
10	15	10	10	5	50

Prescribed Text-Book: Zielsprache Deutschals Fremdsprache Part 1
References: **Studio D A1** by Hermann Funk, Christina Kuhn and Silke Demme, Cornelsen, 2013

Tangram A1by Rosa Maria Dallapiazza, Eduard von Jan & Till Schoenherr, Max Hueber, 2007

SprachtrainingA1 by Rita Maria Niemann, Dong Ha Kim, Cornelsen, 2013
Dictionaries for reference: **Studio D: Glossar** A1 - Deutsch –Englisch, Cornelsen, 2013
http://www.duden.de/woerterbuch
Materials are given in form of photocopies if felt to be necessary

SPANISH - V

Course Code	Credit Units	Semester
FLS 501	02	5

Course Learning Objective:

- Students will hone intermediate language skills such as reading, writing, speaking, listening & interactive) in the language
- Students will be able to read and interpret small texts of intermediate level.
- Students will be able to communicate in small sentences in Simple Future and Past tenses.
- Students will be able to communicate in oral in small sentences in Simple Future and Past tenses. etc.
- To talk about a pre decided plan
- To talk about a plan yet to materialize
- Topropose a plan
- To talk about what they have done today/during vacations etc.
- Reading texts about Spanish festivals
- Writing composition about Festivals

Course Content:

Vocabulary:
Vocabulary related to leisure time, going out with friends, traveling, shopping, club, transport, decoration and celebration.

Grammar:
Introduction of direct/indirect object pronouns
(Pensar + infinitive),
(Estar pensando en + infinitive)
(Por qué no + verbo / Te Parece + Infinitivo.. etc)
(Haber + participio Pasado)
Introductionof pretérito perfecto

ExaminationScheme:

Total: 100 marks

ContinuousEvaluation (Total 50 Marks)					EndSemEvaluation (Total 50 Marks)
Quiz	MidTerm Test	Presentation	Viva Voce	Attendance	End-TermExam
10	15	10	10	5	50

Text &References:
Nuevo Español Sin Fronteras (ESF1) by Jesús sánchez Lobato, Concha Moreno Garcia, Concha Moreno Garcia, Isabel Santos Gargallo, Sociedad General Española De Librería, S.A 2005
Pasaporte Nivel (A1) byMatideCerraloza Aragón, oscarCerraloza Gilli, Begoña Llovet Barquero, EdelsaGroup didascalia, S.A. 2005
Dictionaries for reference: Collins, www.wordreferences.com.
Essential materials are given in the form of photocopies.

CHINESE – V

Course Code	Credit Units	Semester
FLC 501	02	5

Course Learning Objectives:

- Students will hone intermediate language skills such as reading, writing, speaking, listening & interactive) in the language
- Students will be able to read and interpret small texts of intermediate level.
- Students will be able to communicate in small sentences in Simple Future and Past tenses.
- Students will be able to communicate in oral in small sentences in Simple Future and Past tenses. etc.

On the completion of Fifth semester the students will be able to

- Read Chinese words, phrases and simple sentences both in Pin Yin and Characters given in the text.
- Write Chinese Characters and sentences and small paragraphs.
- Speak Chinese dialogues from various fields of day to day life.
- Listen and understand simple Chinese words and dialogues used in syllabi.
- Carry out conversation in the target language based on the topics learnt.
- Manipulate basic grammatical structures.
- Master and use most essential vocabulary items of day to day use, programme specific and internet related vocabulary; approx 80 Characters including 50 characters of HSK level –II
- Type Chinese document.
- Express their opinion and ask opinion of others in Chinese

COURSE CONTENT

1. Revision of vocabulary
2. Detailed study of greetings, farewell & personal information (HSK-II topics 1& 2)
3. A brief description of mood & colours
4. Expression of opinions
5. Asking the opinion of the others
6. Listening of dialogues
7. Conversation based on topics learnt
8. CBT package
9. Programme specific vocabulary and expressions
10. Chinese typing and making soft copy of a Chinese document
11. Important Chinese sites and internet related vocabulary

GRAMMAR CONTENT

1. Pattern:因为……所以……
2. Preposition 介词: 在
3. Auxiliary verbs; 助动词

4. Modal Particle 语气助词:了

EXAMINATION SCHEME

Total: 100 marks

Continuous Evaluation (Total 50 Marks)					End Sem Evaluation (Total 50 Marks)
Quiz	**Mid Term Test**	**Presentation**	**Viva Voce**	**Attendance**	**End-Term Exam**
10	**15**	**10**	**10**	**5**	**50**

Text Books & References

1. Learn Chinese with me book-II. (Major Text Book)
2. Module on HSK-II. (suggested reading)
3. Practical Chinese Grammar for foreigners. (suggested reading)
4. Internet Chinese. (suggested reading)
5. Office Talk (suggested reading)
6. Elementary Chinese Reader Book-I (suggested reading)

WEB TECHNOLOGIES

Course Code	Credit Units	Semester
BCA 601	03	6

CLO1: Design and develop animations in flash to be used in webpages in form of sliders, banners, buttons, menu, etc.
CLO 2: Design logos and other vector images in coreldraw to be implemented in web pages to make it more attractive and impressive.
CLO 3: Learn means of correcting and modifying the raster and vector graphics to suit as per the standards of implementing an image in a webpage using photoshop application.
CLO 4: Design a dynamic website using Dreamweaver application using WYSISYG approach.

Course Contents:

Unit I: Flash basics

Motion tween, Motion Guide, Masking, Shape Tween, Working With Layers, **Animation & Effects,** 3D Animation in Flash CS5, Animated Car Banner, Bouncing Effect, Blur Effect, Burning Image Effect, Checkboard Effect, Circular Ripple Effect, Fade In Effect, Lighting Effects.

Unit II: Corel draw basics

The Workspace, Configuring the Workspace, The Toolbox, Drawing Basics, Dockers, The Transformation Docker, The Shaping docker, Weld Command, Trim and Intersect command, Object manager docker, outlines and fills, about curves, Outline to object.

Unit III: Photoshop basics

Interface Introduction, Panels & Workspaces, Raster Image principles, Dimension, & Resolution, Layers, Common file types, Colour, Making selections, Copy & paste, Transform tools, using brushes Go to page, Eraser tool & Layer masking, Shape tool.

Unit IV

Type principals, Layer styles, Paths & the Pen tool, Smart objects, Colour adjustments, Adjustment layers, Filters, Blending modes.

Unit V: Dreamweaver basics

Introduction, interface basics, view types, anchor links, insert divs, images, hotspots, meta tags, script tags, inserting table, frames, heading, content and formatting tags, form tag, input and select tag, template design in Dreamweaver, importing a website design, extensions.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- HTML, DHTML, JavaScript, Perl, CGI, Ivan Bayross, BPB Publication.

References:

- HTML Complete Reference, BPB Publication.

INTRODUCTION TO PYTHON TECHNOLOGIES

Course Code	Credit Units	Semester
BCA 602	03	6

CLO1: To learn how to use lists, tuples, and dictionaries in Python programs and identify Python object types.
CLO2: To learn how to use indexing and slicing to access data in Python programs
CLO3: Use if-else statements and switch-case statements to write programs in Python to tackle any decision-making scenario
CLO4: To learn how to read and write files in Python.
CLO5: Develop cost-effective robust applications using the latest Python trends and technologies.
CLO6: Build systems entire web development process using various tools.

UNIT I

ALGORITHMIC PROBLEM SOLVING

Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion). Illustrative problems: find minimum in a list, insert a card in a list of sorted cards, guess an integer number in a range, Towers of Hanoi.

UNIT II

DATA, EXPRESSIONS, STATEMENTS

Python interpreter and interactive mode; values and types: int, float, boolean, string, and list; variables, expressions, statements, tuple assignment, precedence of operators, comments; modules and functions, function definition and use, flow of execution, parameters and arguments; Illustrative programs: exchange the values of two variables, circulate the values of n variables, distance between two points.

UNIT III

CONTROL FLOW, FUNCTIONS

Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else); Iteration: state, while, for, break, continue, pass; Fruitful functions: return values, parameters, local and global scope, function composition, recursion; Strings: string slices, immutability, string functions and methods, string module; Lists as arrays. Illustrative programs: square root, gcd, exponentiation, sum an array of numbers, linear search, binary search.

UNIT IV

LISTS, TUPLES, DICTIONARIES

Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters; Tuples: tuple assignment, tuple as return value; Dictionaries: operations and methods; advanced list processing – list comprehension; Illustrative programs: selection sort, insertion sort, mergesort, histogram.

UNIT V

FILES, MODULES, PACKAGES

Files and exception: text files, reading and writing files, format operator; command line arguments, errors and exceptions, handling exceptions, modules, packages; Illustrative programs: word count, copy file.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	10	15	5	70

Text & References:

Python Programming: An introduction to computer science.

Reference:

Learning Python: Powerful Object Oriented Programming.

WEB TECHNOLOGIES LAB

Course Code	Credit Units	Semester
BCA 621	01	6

CLO1: Recognize the concept of animation using the adobe flash application.
CLO2. Identify the utility of various tags, properties of html package.
CLO3. Describe problem solving approach through the design and implementation of form and its elements.
CLO4. Apply hands on real time validation using the JavaScript.

List of Programmes

1. Create the animation of flying bird in flash.
2. Create the animation of walking man with his arms and legs moving.
3. Create the animation of Virtual typewriter.
4. Show a example of Masking in flash.
5. Make an animation of bouncing ball using flash.
6. Create the animation of moving Car in flash.
7. Make the blinking colorful text in flash.
8. Make a scenery showing rising sun in it using flash.
9. Show a flower growing in a flower pot.
10. WAP to develop a student Registration Form using HTML.
11. WAP to show the scrolling text using Marquee Element using HTML.
12. WAP to draw a table with three rows and three columns.
13. WAP to show Image Mapping.
14. WAP to show the functionality of FORWARD and BACK button of History class using JavaScript.
15. WAP to show front level validation in a Registration Form.

Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

INTRODUCTION TO PYTHON TECHNOLOGIES LAB

Course Code	Credit Units	Semester
BCA 622	01	6

CLO1: To learn how to use lists, tuples, and dictionaries in Python programs and identify Python object types.
CLO2: To learn how to use indexing and slicing to access data in Python programs.
CLO3: Use if-else statements and switch-case statements to write programs in Python to tackle any decision-making scenario.
CLO4: To learn how to read and write files in Python.
CLO5: Develop cost-effective robust applications using the latest Python trends and technologies.
CLO6: Build systems entire web development process using various tools.

1. Programs that take command line arguments (word count)
2. Find the most frequent words in a text read from a file.
3. Compute the GCD of two numbers.
4. First n prime numbers.
5. Find the square root of a number (Newtons method).
6. Find Exponentiation (power of a number).
7. Find the maximum of a list of numbers.
8. Multiply matrices
9. Linear search
10. Binary search
11. Selection sort
12. Insertion sort
13. Merge sort
14. Simulate elliptical orbits in Pygame
15. Simulate bouncing ball using Pygame

Examination Scheme:

IA				EE	
A	PR	LR	V	PR	V
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

MAJOR PROJECT

Course Code	Credit Units	Semester
BCA 660	15	6

CO1. Identify the proposed problem
CO2. Develop a functional application based on the software design
CO3. Apply to code, debugging, and testing tools for implementation
CO4. Prepare the proper documentation for report writing and oral presentation.

GUIDELINES FOR PROJECT FILE

Project experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation.

Project is genuine exploration of the unknown that leads to new knowledge, which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals.
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

Report Layout

The report should contain the following components:

1. File should be in the following specification:

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components:

Front Page

Table of Contents
Acknowledgement
Student Certificate
Company Profile
Introduction
Chapters
Appendices
References / Bibliography

- **Title or Cover Page or Front Page**
  The title page should contain the following information: Project Title; Student's Name; Course; Year; Supervisor's Name.

- **Table of Contents**
  Titles and subtitles are to correspond exactly with those in the text.

- **Acknowledgement**
  Acknowledgment to any advisory or financial assistance received in the course of work may be given.

- **Student Certificate**
  Given by the Institute.

- **Company Certificate & Profile**
  This is a certificate, which the company gives to the students. A Company Profile corresponds to a file with company-specific data. Company data can be stored there and included in a booking when needed.

- **Introduction**
  Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

- **Chapters**
  All chapters and sections must be appropriately numbered, titled and should neither be too long nor too short in length.
  The first chapter should be introductory in nature and should outline the background of the project, the problem being solved, the importance, other related works and literature survey. The other chapters would form the body of the report. The last chapter should be concluding in nature and should also discuss the future prospect of the project.

- **Appendices**
  The Appendix contains material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

- **References / Bibliography**
  This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project. Project execution is concerned with assessing how much work has been put in.

The File should fulfill the following ***assessment objectives:***

1. **Range of Research Methods used to obtain information**

2. **Execution of Research**

3. **Data Analysis**
   - Analyze Quantitative/ Qualitative information
   - Control Quality

4. **Draw Conclusions**

Examination Scheme:

Components	**MRP**	**V**	**S**	**FP**	**R**
Weightage (%)	20	20	20	20	20

MRP – Mid Report Presentation, V – Viva, S – Synopsis, FP – Final Presentation, R - Report

Bachelor of Science - Information Technology (B.Sc.IT)

Programme Code: 12049

Duration – 3 Years Full Time

Programme Structure
and
Curriculum & Scheme of Examination
2021-24

AMITY UNIVERSITY

RAJASTHAN

PREAMBLE

Amity University aims to achieve academic excellence by providing multi-faceted education to students and encourage them to reach the pinnacle of success. The University has designed a system that would provide rigorous academic programme with necessary skills to enable them to excel in their careers.

This booklet contains the Programme Structure, the Detailed Curriculum and the Scheme of Examination. The Programme Structure includes the courses (Core and Elective), arranged semester wise. The importance of each course is defined in terms of credits attached to it. The credit units attached to each course has been further defined in terms of contact hours i.e. Lecture Hours (L), Tutorial Hours (T), Practical Hours (P). Towards earning credits in terms of contact hours, 1 Lecture and 1 Tutorial per week are rated as 1 credit each and 2 Practical hours per week are rated as 1 credit. Thus, for example, an L-T-P structure of 3-0-0 will have 3 credits, 3-1-0 will have 4 credits, and 3-1-2 will have 5 credits.

The Curriculum and Scheme of Examination of each course includes the course objectives, course contents, scheme of examination and the list of text and references. The scheme of examination defines the various components of evaluation and the weightage attached to each component. The different codes used for the components of evaluation and the weightage attached to them are:

Components	Codes	Weightage (%)
Case Discussion/ Presentation/ Analysis	C	05 - 10
Home Assignment	H	05 - 10
Project	P	05 - 10
Seminar	S	05 - 10
Viva	V	05 - 10
Quiz	Q	05 - 10
Class Test	CT	10 - 15
Attendance	A	05
End Semester Examination	EE	50

It is hoped that it will help the students study in a planned and a structured manner and promote effective learning. Wishing you an intellectually stimulating stay at Amity University.

July, 2020

PROGRAMME LEARNING OUTCOME (PLO)

BACHELOR OF SCIENCE (Information Technology) (B.Sc.(IT)

PLO- 1 Identify the core concepts of Information Technology, both theoretical and applied;

PLO- 2 Investigate new technologies, tools, practices and standards, and relate to their knowledge domain.

PLO- 3 Acquaint with design and development tools, and engage in systematic evaluation using current methodologies;

PLO- 4 Demonstrate the ability to integrate IT knowledge and develop industry oriented projects.

SKILL DEVELOPMENT DETAILS WITH CREDITS OF B.Sc(IT) PROGRAMME

Sr. No.	Sem	Skill Development	Credit	Employability	Credit	Entrepreneurship	Credit	Total Nos.	Total Credit
1	I	4	8	0	0	0	0	**4**	**8**
2	II	5	11	2	6	0	0	**7**	**17**
3	III	2	4	1	3	0	0	**3**	**7**
4	IV	4	8	0	0	0	0	**4**	**8**
5	V	7	15	0	0	0	0	**7**	**15**
6	VI	0	0	1	15	3	9	**4**	**24**
	Total	**22**	**46**	**4**	**24**	**3**	**9**	**29**	**79**

SKILL DEVELOPMENT SUBJECTS IN B.Sc(IT) PROGRAMME

Sem	Course Code	Course Name
I	BCI104	Programming and Problem solving through 'C' Language
I	BCI105	Computer Concepts and Problem Solving
I	BCI124	Programming and Problem solving through 'C' Language Lab
I	BCI125	Computer Concepts and Problem Solving Lab
II	BCI202	Introduction to Systems Analysis & Design
II	BCI203	Data Structures using C
II	BCI204	Introduction to Database Management Systems
II	BCI223	Data Structures using C LAB
II	BCI224	Introduction to Database Management Systems LAB
III	BCI303	Object Oriented Programming Concepts Using C++
III	BCI323	Object Oriented Programming Concepts Using C++ Lab
IV	BCI431	Introduction to .NET Technologies
IV	BCI432	Introduction to Open Source Technologies (PHP, MySql)
IV	BCI441	Introduction to .NET Technologies Lab
IV	BCI442	Introduction to Open Source Technologies (PHP, MySql) Lab
V	BSI501	Software Engineering
V	BCI502	Java Programming
V	BCI503	UNIX Operating System & Shell Programming
V	BCI522	Java Programming Lab
V	BCI523	UNIX Operating System & Shell Programming Lab
V	BCI533	Android Programming
V	BCI543	Android Programming Lab

Employability

Sem	Course Code	Course Name
II	BCI232	Internet Fundamental
II	BCI233	Cyber Security
III	BCI332	Web Designing
VI	BSI660	Major Project

Entrepreneurship

Sem	Course Code	Course Name
III	BSI 334	E- Governance
VI	BSI602	E-Waste Management
VI	BSI603	Green Computing

PROGRAMME STRUCTURE CREDITS SUMMARY

Bachelor of Science - Information Technology (B.Sc.(IT)-2021

	Credits UG (3 years/ 6 Semesters)							
Semester	CC	DE	VA	OE	EVS	NTCC	ANDP	Total
I	17	0	04	0	0	0	02	23
II	14	03	04	03	0	0	02	26
III	10	03	04	03	04	03	02	29
IV	13	04	04	03	0	06	02	32
V	11	04	04	03	0	03	02	27
VI	09	0	0	0	0	15	0	24
Total	74	14	20	12	4	27	10	161

Core Courses	CC
Domain Electives	DE
Value Added Course	VA
Open Electives	OE
Environmental Science	EVS
Project Work (Non Teaching Credit Course)	NTCC
Anandam Project	**NTCC**

PROGRAMME STRUCTURE SUBJECTWISE CATEGORY SUMMARY

Bachelor of Science - Information Technology (B.Sc.(IT)-2021

	Courses/Subjects for UG (3 years/ 6 Semesters) Programme							
Semester	CC	DE	VA	OE	EVS	NTCC	ANDP	Total
I	07	0	06	0	0	0	01	14
II	06	03	06	01	0	0	01	17
III	04	04	06	01	01	01	01	18
IV	05	06	06	01	0	01	01	20
V	05	06	06	01	0	01	01	20
VI	03	0	0	0	0	01	0	04
Total	30	19	30	04	01	04	05	93

Core Courses	CC
Domain Electives	DE
Value Added Course	VA
Open Electives	OE
Environmental Science	EVS
Project Work (Non Teaching Credit Course)	NTCC
Anandam Project	**NTCC**

PROGRAM STRUCTURE
Bachelor of Science - Information Technology (B.Sc. IT)
2021-24

FIRST SEMESTER

Code	Course	Category	L	T	P/FW	Credit Units
BSI101	Human Computer Interaction	CC	2	1	-	3
BCI102	Basic Mathematics	CC	2	1	-	3
BCI103	Introduction to Computer Networking	CC	2	1	-	3
BCI104	Programming & Problem Solving through 'C' Language	CC	2	1	-	3
BCI105	Computer Concepts & Problem Solving	CC	2	1	-	3
BCI124	Programming & Problem Solving through 'C' Language LAB	CC	-	-	2	1
BCI125	Computer Concepts & Problem Solving Lab	CC	-	-	2	1
Non Teaching Credit Course (NTCC)						
AND001	Anandam-I	ANDP	-	-	-	2
VALUE ADDED COURSES						
BCS 101	English	VA	1	-	-	1
BSS 103	Behavioural Science-I (Understanding Self for Effectiveness)	VA	1	-	-	1
FLT 101 FLG 101 FLS 101 FLC 101	Foreign Language - I French German Spanish Chinese	VA	2	-	-	2
	TOTAL					**23**

SECOND SEMESTER

Code	Course	Category	L	T	P/FW	Credit Units
BSI201	Fundamentals of E-Commerce	CC	2	1	-	3
BCI202	Introduction to Systems Analysis & Design	CC	2	1	-	3
BCI203	Data Structure using C	CC	2	1	-	3
BCI204	Introduction to Database Management Systems	CC	2	1	-	3
BCI223	Data Structure using C LAB	CC	-	-	2	1
BCI224	Introduction to Database Management Systems LAB	CC	-	-	2	1
DE Elective: Choose any one course from the following courses						
BCI231	Networking for Home & Small Business	DE	2	1	-	3
BCI232	Internet Fundamentals	DE				
BCI233	Cyber Security	DE				
OPEN ELECTIVE						
	OPEN ELECTIVE	OE	2	1	-	**3**
Non Teaching Credit Course (NTCC)						
AND002	Anandam-II	ANDP	-	-	-	2
VALUE ADDED COURSES						
BCS 201	English	VA	1	-	-	1
BSS 203	Behavioural Science – II (Problem Solving and Creative Thinking)	VA	1			1
FLT 201 FLG 201 FLS 201 FLC 201	Foreign Language - II French German Spanish Chinese	VA	2	-	-	2
		TOTAL				**26**

SUMMER PROJECT – I

THIRD SEMESTER

CODE	COURSE	CATEGORY	L	T	P/FW	CREDIT UNITS
BSI301	Digital & Computer Organization	CC	2	1	-	3
BSI 302	Introduction to Information systems	CC	2	1	-	3
BCI 303	Object Oriented Programming Concepts Using C++	CC	2	1	-	3
BCI 323	Object Oriented Programming Concepts using C ++ Lab	CC	-	-	2	1
EVS001	Environmental Studies	EVS	4	-	-	4
DE Elective: Choose any one course from the following courses						
BCI 331	Working at a small to medium business or ISPs	DE	2	1	-	3
BCI 332	Web Designing	DE				
BCI 333	Advance Technologies in Computer Science	DE				
BSI 334	E- Governance	DE				
OPEN ELECTIVE						
	Open Elective	OE	2	1	-	3
Non Teaching Credit Course (NTCC)						
BSI 351	Summer Project –I	NTCC	-	-	-	3
AND003	Anandam-III	ANDP	-	-	-	2
VALUE ADDED COURSES						
BCS 301	Communication Skills – I	VA	1	-	-	1
BSS 303	Behavioural Science - III (Interpersonal Communication and relationship Management)	VA	1	-	-	1
FLT 301 FLG 301 FLS 301 FLC 301	Foreign Language - III French German Spanish Chinese	VA	2	-	-	2
	TOTAL					**29**

FOURTH SEMESTER

CODE	COURSE	CATEGORY	L	T	P/FW	CREDIT UNITS
BCI401	Computer Graphics	CC	2	1	-	3
BCI402	Design & Analysis of Algorithm	CC	2	1	-	3
BCI403	Operating Systems	CC	2	1	-	3
BSI 404	Multimedia Technologies	CC	2	1	-	3
BCI421	Computer Graphics LAB	CC	-	-	2	1
DE Elective: Choose any one course from the following courses						
BCI431	Introduction to .NET Technologies	DE	2	1	-	3
BCI432	Introduction to Open Source Technologies (PHP, MySql)	DE				
BCI433	Introduction Routing & Switching in the Enterprise	DE				
BCI441	Introduction to .NET Technologies Lab	DE	-	-	2	1
BCI442	Introduction to Open Source Technologies (PHP, MySql) LAB	DE				
BCI443	Introduction Routing & Switching in the Enterprise Lab	DE				
OPEN ELECTIVE						
	Open Elective	OE	2	1	-	3
Non Teaching Credit Course (NTCC)						
BSI450	Minor Project	NTCC	-	-	-	6
AND004	Anandam-IV	ANDP	-	-	-	2
VALUE ADDED COURSES						
BCS 401	Communication Skills – II	VA	1	-	-	1
BSS 403	Behavioural Science - IV (Group Dynamics & Team Building)	VA	1	-	-	1
FLT 401 FLG 401 FLS 401 FLC 401	Foreign Language - IV French German Spanish Chinese	VA	2	-	-	2
	TOTAL					**32**

SUMMER PROJECT – II

FIFTH SEMESTER

CODE	COURSE	CATEGORY	L	T	P/FW	CREDIT UNITS
BSI501	Software Engineering	CC	2	1	-	3
BCI502	Java Programming	CC	2	1	-	3
BCI503	UNIX Operating System & shell Programming	CC	2	1	-	3
BCI522	Java Programming LAB	CC	-	-	2	1
BCI523	UNIX Operating System & shell Programming Lab	CC	-	-	2	1
DE Elective: Choose any one course from the following courses						
BCI531	Designing & Supporting Computer Network	DE	2	1	-	3
BCI532	Data warehousing & Data Mining	DE				
BCI533	Android Programming	DE				
BCI541	Designing & Supporting Computer Network LAB	DE	-	-	2	1
BCI542	Data warehousing & Data Mining Lab	DE				
BCI543	Android Programming Lab	DE				
OPEN ELECTIVE						
	Open Elective	OE	2	1	-	3
Non Teaching Credit Course (NTCC)						
BSI551	Summer Project – II	NTCC	-	-	-	3
AND005	Anandam-V	ANDP	-	-	-	2
VALUE ADDED COURSES						
BCS 501	Communication Skills – III	VA	1	-	-	1
BSS 503	Behavioural Science - V (Individual Society and Nation)	VA	1	-	-	1
FLT 501 FLG 501 FLS 501 FLC 501	Foreign Language - V French German Spanish Chinese	VA	2	-	-	2
	TOTAL					**27**

SIXTH SEMESTER

CODE	COURSE	CATEGORY	L	T	P/FW	CREDIT UNITS
BSI601	Introduction to Enterprise Resource Planning	CC	2	1	-	3
BSI602	E-Waste Management	CC	2	1	-	3
BSI603	Green Computing	CC	2	1	-	3
Non Teaching Credit Course (NTCC)						
BSI660	Major Project	NTCC	-	-	-	15
	TOTAL					**24**

HUMAN COMPUTER INTERACTION

Course Code	L	T	P	Credit	Semester
BSI101	2	1	0	3	I

Course Learning Outcome:

CLO 1: Understand the principles of human computer interaction
CLO 2: Design good user interfaces for end users experience
CLO 3: Prototype the human computer interaction design
CLO 4: Evaluate the human computer interaction prototype model

Course Contents:

Unit: I: Introduction
Importance of user Interface-definition, importance of good design, benefits of good design, brief history of screen design, the graphical user interface - popularity of graphics, the concept of direct manipulation, graphical system, characteristics, web user - Interface popularity, characteristics - Principles of user interface.

Unit II: Design process
Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions

Unit III: Screen Designing
Design goals-Screen planning and purpose, 8 organizing screen elements, ordering of screen data and content-screen navigation and flow - visually pleasing composition - amount of information - focus & emphasis-presentation information simply & meaningfully-information retrieval on web-statistical graphics - Technological consideration in interface design

Unit IV: Windows
New and Navigation schemes selection of window, 8 selection of devices based and screen based controls. Components-text and messages, Icons and increases-Multimedia, colors, uses problems, choosing colors.

Unit V: Software tools
Specification methods, interface-Building Tools, Interaction Devices - Keyboard and function keys, pointing devices - speech recognition digitization and generation-image and video displays-drivers.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale Human Computer Interaction, 3rd Edition Prentice Hall, 2004.
- Jonathan Lazar Jinjuan Heidi Feng, Harry Hochheiser, Research Methods inHumanComputer Interaction, Wiley, 2010.
- Ben Shneiderman and Catherine Plaisant Designing the User Interface.
- Strategies for Effective Human-Computer Interaction (5th Edition, pp. 672, ISBN 0-321-53735-1, March 2009), Reading, MA: Addison-Wesley Publishing Co.

BASIC MATHEMATICS

Course Code	L	T	P	Credit	Semester
BCI102	2	1	0	3	I

Course Learning Outcome:

CLO1. Identify matrix operations.

CLO2. Understand the meaning of limit, continuity and differentiation.

CLO3. Evaluate a definite integral using the Fundamental Theorem of Calculus.

CLO4. Identify a general method for constructing solutions to inhomogeneous linear constant-coefficient Second-order equations.

CLO5. Demonstrate Scalar multiplication, magnitude, Vector multiplication and Simple application of Vectors, slope of straight line, centre, radius and equation of a circle."

Course Contents:

Module I: Set Theory
Sets, Types of Sets, Basic Operations on Sets, Venn diagram, Cartesian product of two sets, Distributive law, De Morgan's Law

Module II: Mathematical Logic and circuits
Basic Concepts, Propositions or Statements, Truth Table, Connectives and Compound Propositions, Implication, Bi-conditional of Connectives, Converse, Inverse and Contra positive of an Implication, Tautology, Logical Equivalence, Switching Circuits

Module III: Modern Algebra
Binary Operations, Properties of Binary Operations, Semi group, Monoid, Groups, Finite and Infinite Groups, Algebra of Groups, Subgroups and other Groups.

Module IV: Graph Theory
Graph, Multi Graph, Complete Graph, Bi Graph, Degree, Degree Sequence, Matrices of graphs, tree, spanning trees

Module V: Data Analysis
Data and Statistical Data, Frequency Distribution, Graphical Representation, Measure of the Central Tendency, Measures of Dispersion (Mean Deviation and Standard Deviation)

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Elements of Discrete Mathematics: C.L. Liu
- Graph Theory: Wilson
- S.C Gupta & V.K. Kapoor, Fundamentals of Mathematical Statistics.

- Discrete Mathematics: Harikishan & Shivraj Pundir
- Discrete Mathematics: J.K. Sharma

INTRODUCTION TO COMPUTER NETWORKING

Course Code	L	T	P	Credit	Semester
BCI103	2	1	0	3	I

Course Learning Outcome:

CLO 1: Able to understand the computer networking principals and its applications in our world.

CLO 2: To understand how computer networks work, and its fundamentals when implemented for real world.

CLO 3: To understand various modulation techniques and how they are used to improve network performance.

CLO 4: To be able to understand the working of various network layer protocols such as TCP, IP etc.

Course Contents:

Module I
Introduction to Data Communication, Networks-protocols, advantages, disadvantages & applications, Line Configuration, topology, Transmission mode, Classification of networks. Parallel & Serial Transmissions, Analog & Digital Signals, Periodic & Aperiodic Signals, Modulation---Amplitude Modulation, Frequency Modulation, Phase Modulation, Pulse Amplitude Modulation, Pulse Code Modulation, Sampling.

Module II
Amplitude Shift Keying, Frequency Shift Keying, Phase Shift Keying, Bit/ Baud Comparison, DTE-DCE Interface, 56 K Modem, Cable Modem. OSI Model, Transmission Media-Twisted Pair Cable, Coaxial Cable, Fiber-Optics Cable, Radio frequency Allocation, Terrestrial Microwave, Infrared rays, Satellite Communication, Cellular Telephony. Introduction to ISDN.

Module III
Framing, Line Discipline, Types of Errors, Error Detection & Correction (VRC, LRC, CRC, Checksum, Hamming Code), Flow Control (Stop-and-wait & Sliding Window), Error Control (Stop & Wait ARQ, Sliding Window ARQ using Go-back n method and Selective-Reject). CSMA/CD, Project 802, IEEE Standards-802.3, Token Bus (802.4), Token Ring (802.5), Introduction to Bridges.

Module IV
Internal Organization of Network Layer, Routing Algorithms-Shortest Path Routing, Flooding, Distance Vector Routing, Link State Routing, General Principles of Congestion, Congestion Prevention Policies. Duties of Transport Layer, Connection Establishment & Connection Termination.

Module V
Introduction to TCP/IP, Data Link Layer in Internet-SLIP & PPP, Network Layer in Internet-IP protocol, IP addressing, Subnetting & Internet Control Protocols, Transport Layer in Internet-TCP & UDP.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Behrouz ., Forouzan., "Data Communication and Networking", TMH
- W. Stallings, "Data and Computer Communication" PHI
- A.S. Tanenbaum, "Computer Networks" , PHI

PROGRAMMING & PROBLEM SOLVING THROUGH 'C' LANGUAGE

Course Code	L	T	P	Credit	Semester
BCI104	2	1	0	3	I

Course Learning Outcome:

CLO1: Investigate different concepts of programming approaches in terms of application or project development.

CLO2: Create methods and programs within the field of procedural programming as well as developing logical and analytical approaches to programming problems independently.

CLO3: Apply his/her knowledge in new areas within field of basic programming.

CLO4: Develop independently relevant applications using self logic in the field of programming languages. These methods include performing experiment/programs and interpreting their results.

Course Contents:

Module I: Introduction to Computer Fundamentals
Basic Computer Organization, Computer Hardware Components, Disk, Primary and Secondary Memory, Keyboard, Mouse, Printer, Monitor, CD etc. Computer Software: Introduction to Application software, System Software, Compilers, Interpreters etc. Basic Operating System Concepts, Functional knowledge of MSDOS and WINDOWS. Number System-Binary, Hexadecimal, Octal, and Decimal. Conversion from one number system to another. Computer Codes - ASCII and EBCDIC. Representation of Integers, Fixed and Floating-Point.

Module II: Introduction to 'C' Language
Character set, Variables Identifiers, Data type, Arithmetic operation, Constant, operators, Expression, Assignments, basic input/output statements, Simple 'C. Programs. Decision making in program, Relational Logical operators, if statements, if -else, nested if-else statements, Switch, case loop, Do-While, While, for loop and nesting of loop.

Module III: Arrays and Functions

One Dimensional Arrays, Arrays Manipulation, Sorting, Searching, Problems solving Top down Approach, Modular Programming and functions, Passing Arguments, call by value and call by references, Recursive function,. Recursion

Module IV: Pointers
Pointers: Declaration, Pointer assignments, initialization, Pointers and Dynamic Memory Allocation, Array of Pointers.

Module V: Structure and Union
Structure definition, Declaration, structure Assignments, Arrays in structure, Structure Arrays, Pointer Structure, Nested Structure, Arrays and Arrays of Structure, Union and File Handling

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Problem Solving through C language, E. Balagurusamy, TMH publication.
- Peter Nortons, "Introduction to Computers", TMH
- Let us C, Yashwant Kanetkar, BPB Publication.
- P.K.Sinha, "Computer Fundamentals", BPB Publications
- V. Rajaraman, "Computer Fundamentals", Prentice Hall

COMPUTER CONCEPTS & PROBLEM SOLVING

Course Code	L	T	P	Credit	Semester
BCI105	2	1	0	3	I

Course Learning Outcome:

CLO 1: Recognize the concept of Computer Organization.

CLO 2: Identify the utility of various office package tools and their application.

CLO 3: Describe problem solving approach through the design and implementation of algorithm.
CLO 4: Apply hands on real time development of algorithm based on various techniques.

Course Contents:

MODULE I: FUNDAMENTALS OF COMPUTERS
Evolution of Computers, Inputs/Outputs devices, Alternative Methods of Input, Organization of Modern Digital Computers, Operating System, Multitasking OS, Graphical User Interface.

MODULE II: WORD PROCESSING
Word Processing Programs and Their Uses, Word Processor's Interface, Editing Text Formatting Text, Macro, Special Features of Word, Desktop Publishing Service, Converting doc into www pages.

MODULE III: SPREADSHEET SOFTWARE
Spreadsheet Programs, Applications, Spreadsheet package features, attributes, structure, label, data, importing data, formula, functions, data handling, Managing workbooks.

MODULE IV: INTRODUCTION TO COMPUTER PROBLEM SOLVING
Introduction, Problem Solving aspects, Top-Down Design-Implementation of Algorithms, Program Verification-Efficiency of Algorithm, Analysis of Algorithm fundamental algorithm, factorial computation, generation of Fibonacci sequence.

MODULE V: FACTORING AND ARRAY TECHNIQUES
Factoring Methods, finding the square root of a number, generating prime numbers, Array techniques, array order reversal, Finding the maximum number in a set, Removal of duplicates from an ordered Array-finding the k^{th} smallest element.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Yashavant P. Kanetkar "Pointers In C", BPB Publications, NewDelhi, 2002
- E.Balagurusamy "Programming in ANSI C", Tata McGraw Hill, 2004
- V.Rajaraman "Computer Programming in C" Prentice Hall of India, New Delhi, 2001
- Kamthane, A.N., "Programming with ANSI and Turbo C", Pearson Education, Delhi, 2006.
- Deitel and Deitel "C How to Program", Addisson Wesley, 2001

PROGRAMMING & PROBLEM SOLVING THROUGH 'C' LANGUAGE LAB

Course Code	L	T	P	Credit	Semester
BCI124	0	0	2	1	I

Course Learning Outcome:

CLO1:Investigate different concepts of programming approaches in terms of application or project development.

CLO2: Create methods and programs within the field of procedural programming as well as developing logical and analytical approaches to programming problems independently.

CLO3:Apply his/her knowledge in new areas within field of basic and advanced programming.

CLO4:Develop independently relevant applications using self logic in the field of programming languages. These methods include performing experiment/programs and interpreting their results.

LIST OF PRACTICALS

1. Enter the two numbers and perform the following operations:-
   Addition, Subtraction, Multiplications, Division, Exponent, Mod

2. WAP to swap two numbers:
   a) By using third variable. b) Without using third variable.

3. WAP to print the result the of quadratic equation
   a) Without using if statement.
   b) By using if statement.

4. WAP to print a) Fibonacci series 1 1 2 3 5..... b) Series 1 1 1 3 5 9.....

5. Write a menu driven program
   a) To evaluate the equation y=x^n where n is the non-negative integer
   b) The total number of even integers in the set.
   c) The total number of odd integers in the set.
   d) The sum of all even integers.
   e) The sum of all odd integers

6. Check whether a string is palindrome or not.

7. WAP to calculate the following expression.
   x=1+x+ (x^2) /2! + (x^3)/ 3! +.....n for this expression calculate the factorial.
   a) Without Recursive Function.
   b) With Recursive Function.
   c) 30. Write a program to generate the following figures: Any two

a.
```
   *
  * *
 * * *
  * *
   *
```

b.
```
    *
   * *
  * * *
 * * * *
```

c.
```
1
12
123
1234
12345
```

d.
```
    1
   121
  12321
 1234321
123454321
```

e.
```
1
12
123
1234
12345
1234
123
12
1
```

f.
```
654321
54321
4321
321
21
1
```

g.
```
543212345
5432 2345
543   345
54     45
5       5
```

h.
```
  z
 yzy
xyzyx
 yzy
  z
```

8. Write a program to find the larger of the two numbers using macro with arg.

9. WAP to calculate an electric power distribution company who charges its customer as follows.

Consumption units	Rate of charges
0 - 200	Rs 0.50 per unit
201 - 400	Rs 100 plus Rs 0.65 per unit excess of 200 units
401 - 600	Rs 230 plus Rs 0.80 per unit excess of 400 units
601 and Above	Rs 390 plus Rs 1.00 per unit.

Calculate and print the result.

10. Write a program to find a number of and sum of all the integers greater than 100 and less than 200 that are divisible by 7.

11. Write a program to enter a character (alphabetical) and display its position and its corresponding ASCII value.

12.

Purchase	Discount	Hand loom items
0 - 100	-	-
101 - 200	5.0 %	7.5 %
201 - 300	7.5 %	10.0 %
Above 300	10.0 %	15.0 %

A cloth show room has announced the following discount on purchase of items. Write a program using switch and if statement to compute the net amount to be paid.

13. WAP to print the multiplication table from 1 to 12.
1.....10, 12.....120.
Do the above question in the tabular form.

14. WAP to evaluate power of 2 upto 20 by using loop. 2^0=1.....2^20=

15. WAP to reverse the number given by the user and perform the addition.

16. Take two variables a and b and store the result of operation in the third variable c by using following data types:-
a) int a, b, and float c.
b) float a, b, and int c.
c) float a, c, and int b.
d) float a and int b, c.

17. WAP to maintain the employee record.
i) emp. no.
ii) emp name.
iii) emp salary (emp basic, HRA, DA, CCA). HRA 15% and DA 30% of basic.

18. WAP to calculate the depreciation value of any product after three years.

19. Write the C statements to evaluate the following equations.
a) Area = pi*(r^2)+2(pi)rh.
b) Torque = (2 m1 m2)/(m1 + m2)*g
c) Side= sqrt(a^2+ b^2-2ab*cos(x))
d) Energy = mass[acceleration * height + (velocity^2)/2]

20. Determine the value of each of the following logical expressions of a=5, b=10, c=6
a) a>b && a<c.
b) a<b && a>c.
c) a==c || b>a.
d) b>15 && c<0 || a>0.
e) (a\2.0==0.0 && b\2.0 !==0.0) || c<0.0.

21. WAP to calculate the following expressions if x-y=0 then it should give an error.
a) (x+y)/(x-y)
b) (x-y)/2.
c) (x+y)(x-y)

22. Write a program to count the number of character, word and lines in a text file whose name is supplied in the command line.

23. Write a program to arrange a list by using any sorting method.

24. Write a program to create, display, modify and append a file (sequential file).

25. Write a program to perform arithmetic operations on an array.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

COMPUTER CONCEPTS & PROBLEM SOLVING LAB

Course Code	L	T	P	Credit	Semester
BCI125	0	0	2	1	I

Course Learning Outcomes:

CLO 1: Recognize the concept of Computer Organization.

CLO 2: Identify the utility of various office package tools and their application.

CLO 3: Describe problem solving approach through the design and implementation of algorithm.

CLO 4: Apply hands on real time development of algorithm based on various techniques.

LIST OF PRACTICALS

1 Program to find sum of two numbers

2 Program to find area and circumference of circle. [A=3.14*R*R & C=2*3.14*R]

3 Program to find the simple interest. [SI=(P*R*T)/100]

4 Program to convert temperature from degree centigrade to Fahrenheit.
[F=(1.8*C)+32]

5 Program to calculate sum of 5 subjects & find percentage

6 Program to use bitwise AND & OR operator between the two integers

7 Program to shift inputted data by two bits to the left

8 Program to show swap of two no's without using third variable

9 Program to find gross salary.
[Gross Salary= Basic salary + T.A. (12% of Basic) + D.A. (10% of basic)]

10 Program to find greatest in 3 numbers

11 Program to show the use of conditional operator

12 Program to find that entered year is leap year or not

13 Program to find whether given no is even or odd

14 Program to use switch statement. Display Monday to Sunday.

15 Program to display arithmetic operation using switch case.

16 Program to print a table of any number.

17 Program to display first 10 natural no & their sum.

18 Program to reverse a given number.

19 Program to print stars Sequence1

```
*
* *
* * *
* * * *
* * * * *
```

20 Program to print stars Sequence2

```
*
* *
* * *
* * * * *
* * * *
* * *
* *
*
```

21 Program to print star Sequences3

```
    *
  *   *
*   *   *
*   *   *   *
```

22 Program to print Fibonacci series up to 100

23 Program to find factorial of a number. [Ex: 5! = 5*4*3*2*1]

24 Program to find whether given no is a prime number or not

25 Program to show sum of 10 elements of array & show the average

26 Program to find the maximum no in an array

27 Program to display matrix

28 Program to find sum of two matrices

29 Program to find subtraction of two matrices

30 Program to find multiplication of two matrices

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

Anandam

Course Code	L	T	P	Credit	Semester
AND001	2	0	0	2	I

Course Learning Outcome:

CLO1: Awareness and empathy regarding community issues
CLO2: Interaction with the community and impact on society
CLO3: Interaction with mentor and development of Student teacher relationship
CLO4: Interaction among students, enlarge social network
CLO5: Cooperative and Communication skills and leadership qualities Critical thinking, Confidence and Efficiency

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants, phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.
- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.
3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
6. For the topic chosen by the group, students are recommended to cover the following points:
    a) Current scenario (Regional, national and international level as applicable)
    b) Future predictions
    c) Duty of the government
    d) Government policies (related to the topic), if any
    e) Duty of public
    f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
3. Conclusion is clearly stated. The underlying logic is explicit.

ENGLISH

Course Code	L	T	P	Credit	Semester
BCS101	1	0	0	1	I

A. COURSE LEARNING OUTCOMES (CLO)

CLO 1	**Identify** the basic elements of grammar required for good and effective communication.
CLO 2	**Interpret and discuss** key ideas of grammar, diction and communication.
CLO 3	**Develop** Creative & Literary Sensitivity in all communication.
CLO 4	**Design** and create texts for a variety of purposes and audiences, evaluating and assessing the effectiveness of grammatical aspects.

B. SYLLABUS

Topic
Vocabulary development- Root Words, Affixes, Synonyms, Antonyms, One Word Substitution
Grammar: Fluency and Expression
Tenses
Voices
Tag Questions
Sentence Formation
Communication Essentials, Basics of Communication, Communication Circle

EXAMINATION SCHEME:

Components	CT/Mid-term	Project/ Presentation	Assignment 1	Quiz	Attendance	EE
Weightage (%)	15	10	10	10	5	50

SUGGESTED READINGS

- Martin Hewings, *Advance English Grammar*. Cambridge University Press
- J.V.Vilanilam. *More Effective Communication.* Response Books:NewDelhi
- Wren and Martin, *English Grammar & Comosition*. S.Chand & Co. Ltd.
- Dr. P.Prasad. *Communication Skills*.S.K.Kataria &Sons
- Kavita Sharma, *New Upgraded Encyclopedia of English Grammar & Composition.* English Edition Publishers

- Raman, Meenakshi and Sangeeta Sharma, *Technical Communication: Principles and Practice.* OUP: New Delhi, 2004.Print.
- Koneru, Aruna. *Professional Communication.* The McGraw Hill: New Delhi, 2008. Print
- Krishnaswamy N, *Creative English for Communication***.** Delh**i:** Macmillan Publishers India Ltd. Print. 2007.

BEHAVIOURAL SCIENCE - I
(UNDERSTANDING SELF FOR EFFECTIVENESS)

Course Code	L	T	P	Credit	Semester
BSS103	1	0	0	1	I

Course Learning Outcome:

1. Demonstrate awareness of self and the process of self-exploration.
2. Demonstrate knowledge of strategies for developing a healthy self-esteem.
3. Recognize the importance of attitudes and its effect on personality.
4. Identify the difference between healthy and unhealthy expression of emotions and develop emotiona competence necessary for personal and professional life.

Course Contents:

Module I: Self: Core Competency
Understanding of Self
Components of Self – Self identity
Self concept
Self confidence
Self image

Module II: Techniques of Self Awareness
Exploration through Johari Window
Mapping the key characteristics of self
Framing a charter for self
Stages – self awareness, self acceptance and self realization

Module III: Self Esteem & Effectiveness
Meaning & Importance
Components of self esteem
High and low self esteem
Measuring your self esteem

Module IV: Building Positive Attitude
Meaning and Nature of Attitude
Components and Types of Attitudes
Relevance and Importance of Attitudes

Module V: Building Emotional Competence
Emotional Intelligence – Meaning, Components, Importance and Relevance
Positive and Negative Emotions
Healthy and Unhealthy expression of Emotions

Examination Scheme:

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
Weightage (%)	20	05	20	30	25

Text & References:

- Dressler, David and Cans, Donald: The Study of Human Interaction

- Lindzey, G. and Borgatta, E: Sociometric Measurement in the Handbook of Social Psychology, Addison – Welsley, US.
- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer & Company

FRENCH - I

Course Code	L	T	P	Credit	Semester
FLT101	2	0	0	2	I

Course Learning Outcome:

CLO1: Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
CLO2: Students will be able to read and interpret small texts.
CLO3: Students will be able to communicate in small sentences in writing, self introduction, family description etc.
CLO4: Students will be able to communicate in small sentences in oral, self introduction, family description etc.

Course Contents:

Module A: pp. 01 to 37: Unités 1, 2, Unité 3 Objectif 1,2
Only grammar of Unité 3: objectif 3, 4 and 5

Contenu lexical: Unité 1: Découvrir la langue française: (oral et écrit)

1. se présenter, présenter quelqu'un, faire la connaissance des autres, formules de politesse, rencontres
2. dire/interroger si on comprend
3. Nommer les choses

Unité 2: Faire connaissance

1. donner/demander des informations sur une personne, premiers contacts, exprimer ses goûts et ses préférences
2. Parler de soi: parler du travail, de ses activités, de son pays, de sa ville.

Unité 3: Organiser son temps

1. dire la date et l'heure

Contenu grammatical:

1. organisation générale de la grammaire
2. article indéfini, défini, contracté
3. nom, adjectif, masculin, féminin, singulier et pluriel
4. négation avec « de », "moi aussi", "moi non plus"
5. interrogation: Inversion, est-ce que, qui, que, quoi, qu'est-ce que, où, quand, comment, quel(s), quelle(s)
   Interro-négatif: réponses: oui, si, non
6. pronom tonique/disjoint- pour insister après une préposition
7. futur proche

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1

GERMAN - I

Course Code	L	T	P	Credit	Semester
FLG101	2	0	0	2	I

Course Learning Outcome:

CLO1: Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
CLO2:Students will be able to read and interpret small texts .
CLO3:Students will be able to communicate in small sentences in writing, self introduction, family description etc.
CLO4: Students will be able to communicate in small sentences in oral, self introduction, family description etc.

Course Contents:

Module I: Introduction
Self introduction: heissen, kommen, wohnwn, lernen, arbeiten, trinken, etc.
All personal pronouns in relation to the verbs taught so far.
Greetings: Guten Morgen!, Guten Tag!, Guten Abend!, Gute Nacht!, Danke sehr!, Danke!, Vielen Dank!, (es tut mir Leid!),
Hallo, wie geht's?: Danke gut!, sehr gut!, prima!, ausgezeichnet!,
Es geht!, nicht so gut!, so la la!, miserabel!

Module II: Interviewspiel
To assimilate the vocabulary learnt so far and to apply the words and phrases in short dialogues in an interview – game for self introduction.

Module III: Phonetics
Sound system of the language with special stress on Dipthongs

Module IV: Countries, nationalities and their languages
To make the students acquainted with the most widely used country names, their nationalitie and the language spoken in that country.

Module V: Articles
The definite and indefinite articles in masculine, feminine and neuter gender. All Vegetables, Fruits, Animals, Furniture, Eatables, modes of Transport

Module VI: Professions
To acquaint the students with professions in both the genders with the help of the verb "sein".

Module VII: Pronouns
Simple possessive pronouns, the use of my, your, etc.
The family members, family Tree with the help of the verb "to have"

Module VIII: Colours
All the color and color related vocabulary – colored, colorful, colorless, pale, light, dark, etc.

Module IX: Numbers and calculations – verb "kosten"
The counting, plural structures and simple calculation like addition, subtraction, multiplication and division to test the knowledge of numbers.
"Wie viel kostet das?"

Module X: Revision list of Question pronouns
W – Questions like who, what, where, when, which, how, how many, how much, etc.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation

I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH – I

Course Code	L	T	P	Credit	Semester
FLS101	2	0	0	2	I

Course Learning Objective:

CLO1:Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
CLO2:Students will be able to read and interpret small texts .
CLO3:Students will be able to communicate in small sentences in writing, self introduction, family description etc.
CLO4:Students will be able to communicate in small sentences in oral, self introduction, family description etc.

Course Contents:

Module I
A brief history of Spain, Latin America, the language, the culture…and the relevance of Spanish language in today's global context.
Introduction to alphabets

Module II
Introduction to '*Saludos*' (How to greet each other. How to present / introduce each other).
Goodbyes (despedidas)
The verb *llamarse* and practice of it.

Module III
Concept of Gender and Number
Months of the years, days of the week, seasons. Introduction to numbers 1-100, Colors, Revision of numbers and introduction to ordinal numbers.

Module IV
Introduction to *SER* and *ESTAR* (both of which mean To Be).Revision of '*Saludos*' and '*Llamarse*'. Some adjectives, nationalities, professions, physical/geographical location, the fact that spanish adjectives have to agree with gender and number of their nouns. Exercises highlighting usage of *Ser* and *Estar*.

Module V
Time, demonstrative pronoun (Este/esta, Aquel/aquella etc)

Module VI
Introduction to some key AR /ER/IR ending regular verbs.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras

CHINESE – I

Course Code	L	T	P	Credit	Semester
FLC101	2	0	0	2	I

Course Learning Outcome:

CLO1:Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
CLO2:Students will be able to read and interpret small texts .
CLO3:Students will be able to communicate in small sentences in writing, self introduction, family description etc.
CLO4:Students will be able to communicate in small sentences in oral, self introduction, family description etc.

Course Contents:

Module I
Show pictures, dialogue and retell.
Getting to know each other.
Practicing chart with Initials and Finals. (CHART – The Chinese Phonetic Alphabet Called "Hanyu Pinyin" in Mandarin Chinese.)
Practicing of Tones as it is a tonal language.
Changes in 3rd tone and Neutral Tone.

Module II
Greetings
Let me Introduce
The modal particle "ne".
Use of Please 'qing" – sit, have tea …….. etc.
A brief self introduction – Ni hao ma? Zaijian!
Use of "bu" negative.

Module III
Attributives showing possession
How is your Health? Thank you
Where are you from?
A few Professions like – Engineer, Businessman, Doctor, Teacher, Worker.
Are you busy with your work?
May I know your name?

Module IV
Use of "How many" – People in your family?
Use of "zhe" and "na".
Use of interrogative particle "shenme", "shui", "ma" and "nar".
How to make interrogative sentences ending with "ma".
Structural particle "de".
Use of "Nin" when and where to use and with whom. Use of guixing.
Use of verb "zuo" and how to make sentences with it.

Module V
Family structure and Relations.
Use of "you" – "mei you".
Measure words
Days and Weekdays.
Numbers.
Maps, different languages and Countries.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- "Elementary Chinese Reader Part I" Lesson 1-10

FUNDAMENTALS OF E-COMMERCE

Course Code	L	T	P	Credit	Semester
BSI201	2	1	0	3	II

Course Learning Outcome:

CLO1: Understand the basic concepts and technologies used in the field of E-Commerce and management information systems;
CLO 2: Comprehend the various Models and Categories of E-Commerce and have the knowledge of the different types of management information systems.
CLO 3: Articulate the importance of infrastructure for E-Commerce, and the key elements of a business system as well as the scope and objectives of electronic payment system, implementation of different policies and standards.
CLO 4: Understand the advanced structure in E-commerce, different structure of electronic documents, supply chain management.

Module 1 – Overview of E-Commerce
Traditional Commerce, Origin and Development of E-Commerce, What is E-Commerce?, Role of Internet and WWW in E-Commerce, Scope of E-Commerce, Driving Forces of E-Commerce, Perspective of E-Commerce – Merchant & User, Advantages of E-Commerce, Disadvantages of E-Commerce, E-Commerce in Service Industries, Myths about E-Commerce Development and Implementation.

Module 2 – Models and Categories of E-Commerce
Business Model of E-Commerce - Business - to - Business (B2B), Business - to - Consumer (B2C), Consumer - to - Consumer (C2C), Consumer - to - Business (C2B), Business - to - Government (B2G), Government - to - Business (G2B), Government - to - Citizen (G2C), Intra-organisational E-Commerce, Inter-organisational E-Commerce.

Module 3 – Infrastructure for E-Commerce
Framework of E-Commerce, Distribution Channels of E-Commerce – Pure-Click, Brick-and-Click, and Click-to-Brick, Information Superhighway infrastructure, messaging and information distribution infrastructure, common business infrastructure.

Module 4 - Electronic Payment System
E-Commerce Payment Methods – Internet Banking, Credit Card, Debit Card, Smart Card, E-Money, Wallets, Electronic Fund Transfer (EFT), PayPal, Bitcoin, E-Commerce Payment Processing.

Module 5 – Advances in E-Commerce
Structured Electronic Documents – EDI & XML, M-Commerce, Wireless and Voice Based E-Commerce, Security Issues in E-Commerce, Legal Issues related E-Commerce, E-Commerce Impact on market and retailers, supply chain management, employment, customers.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE

Weightage (%)	15	10	10	10	5	50

Text & References:

- V. RAJARAMAN. ESSENTIALS OF E-COMMERCE TECHNOLOGY. PHI, 2010.
- Kalakota, Ravi, and Andrew B. Whinston. *Electronic commerce: a manager's guide*. Addison-Wesley Professional, 1997.
- Henry Chan, Raymond Lee, and Tharam Dillon. E-Commerce, Fundamentals And Applications. Wiley India, 2001.

INTRODUCTION TO SYSTEMS ANALYSIS & DESIGN

Course Code	L	T	P	Credit	Semester
BCI202	2	1	0	3	II

Course Learning Outcomes:

CLO1: Provides overview of the system development life cycle (SDLC) emphasizing analytical techniques to develop the correct definition of business problems and user requirements.
CLO2: Investigate the feasibility assessment and develop system requirements for an assigned project. CLO5: Describe the role and responsibilities of the participants in information systems° development.
CLO3: The student will be able to analyze business problems and develop a requirements° document, written in clear and concise business language.

CLO4: Develop and present a Requirements Definition Proposal for a new system in a well-structured business proposal.

Course Contents:

Module I: System Concepts and the Information Systems Environment
What is System?, Important System Characteristic, Business Systems, Business, Information Systems, Categories of Information Systems, Transaction, Processing System, MIS, DSS, and Scope of Information system.
The Role of System Analyst: Overview of System Analysis and Design, Multifaceted role of System analyst: Analytical Skill, Technical Skills, and Interpersonal Skills.

Module II: System Development Life Cycle
The System Development Life Cycle, Structured Analysis Development Method, and Systems Prototype Method. System planning and Initial Investigation: System Planning: Information System Committee Method, User Group Committee Method, Initial Investigation, Feasibility Study: Operational, Technical and Economical Feasibility Cost Benefit Analysis: Data Analysis, Cost Benefit Analysis, The system proposal.

Module III: Determining System Requirements
Performing Requirements Determination, Traditional Method, Modern' Methods, and Radical Methods. The Tools of Structured Analysis: Process Modeling: DFD, Logical Modeling: Structured English, Decision Trees, and Data Modeling: ER Diagram

Module IV: Process and Stages of System Design
The process of design: logical design, physical design, Structured Design, Functional Decomposition, and Structured Walkthrough. Input / Output and Forms Design: Input design, output design, *forms* design, types of *forms*, layout considerations and *forms* control.

Module V: File organization and Database Design
File structure, file organization, -objectives of database, data structure, normalization, the role of database administrator. Automated Tools *for* Systems Development: CASE Tools

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- P-analysis & Design of Information Systems James A. Senn
- Modern System Analysis & Design: Jeffery A. Hoffer, Joey F. George, Joseph S. Valacich
- Elements of System Analysis & Design: Elias Awad.

DATA STRUCTURES USING C

Course Code	L	T	Credit	Semester
BCI203	2	1	3	II

Course Learning Outcomes:

CLO1: Students will be able to use linear and non-linear data structures like stacks, queues , linked list etc.

·CLO2: Define basic static and dynamic data structures and relevant standard algorithms for them: stack, queue, dynamically linked lists, trees, graphs, heap, priority queue, hash tables, sorting algorithms, min-max algorithm.

·CLO3: Demonstrate advantages and disadvantages of specific algorithms and data structures,

CLO4: determine and demonstrate bugs in program, recognise needed basic operations with data structures

Course Contents:

Module I: Basic concepts of data representation
ADT: Fundamental & derived data types, Representation, Primitive Data Structures.

Module II: Arrays
Representation of arrays single and multi dimensional arrays. Address calculation using column and rows major ordering. Various operations on arrays, Vector, Application of arrays: matrix multi multiplication, sparse polynomial and addition.

Module III: Stacks and Queues
Representation of stacks and queues using arrays and linked list. Circular queues, priority queue and D-queue. Application of stacks: conversion from infix to postfix expression, Evaluation of postfix expression using stacks.

Module IV: Linked List
Singly linked list; operations on list. Linked stacks and queue. Polynomial representations and manipulation using linked lists, doubly linked list, addition of two polynomial list.

Module V: Trees
Binary trees traversal method: preorder, in-order, post-ordered traversal. Recursive and non-recursive algorithm for above mentioned Traversal methods. Representation of trees and its application: Binary tree representation of tree, Binary search tree: height balanced (AVL) tree

Module VI: Searching, sorting and complexity
Searching: Sequential and binary search, indexed search, Sorting: insertion, selection, bubble, quick, merge, heap sort.

Module VII: Graphs
Graph representation: adjacency list, adjacency multicasts, Traversal scheme: Depth first search, Breadth first search, Spanning tree: intro, minimal spanning tree algorithms.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- T. Langsam, M.J Augenstein and A.M. Tanenbaum, "Data structure using C and C++ Second edition, 2000, Prentice Hall of India.
- R.Kruse, G.L. Tonodo and B. Leung," Data structures and program design in C", Second Edition, 1997, Pearson education.

INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS

Course Code	L	T	P	Credit	Semester
BCI204	2	1	0	3	II

Course Learning Outcome:

CLO1: To investigate about what is database, different types of databases, and why they are valuable assets for decision making. CLO7: Develop a set of queries to handle a specified set of typical user inquiries for information extraction from the database.

CLO2: Analyse the relational database model that takes a logical view of data.

CLO3: Investigate the relationships between entity and how such relationships are incorporated into the database design process.

CLO4: Develop normalization and ER modelling that are used concurrently to produce a good database design.

Course Contents:

Module I: Introduction to DBMS

Definition of DBMS, Data Independence, DBMS Architecture, Levels, Database Administrator, File System Approach Vs DBMS Approach, Advantages of Using a DBMS, Data Models, Schemas, and Instances.

Module II: Relational Database & ER Model

Relational System, Codd's Rule, Relational Model, Optimization, Tables and Views, Entity, Types of Entity, Weak Entity Attributes , Entity sets , Entity – Relationship Diagrams.

Module III: Relational Model Objects

Domains and Relations, Relations and predicates, Relational Data Integrity ; Primary Key, Candidate Key , Foreign Key and their rules; Relational operators, Relational Algebra, Relational Calculus, SQL Language, Data definition, Data retrieval and update operations.

Module IV: Database Design

Definition Of Functional Dependencies, Process Of Normalization, First Normal Form, Second Normal Form, Third Normal Form. Boycee Codd Normal Form, Fourth Normal Form, Fifth Normal Form.

Module V: Data Recovery & Protection

Recovery-Transaction recovery, System recovery, Media Recovery, Concurrency Control Techniques, Locking, Dead Lock, Serializability, Security - Introduction.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Elmasari, Navathe, "Fundamentals of Database Systems", Addision Wesley.
- Korth, Silbertz, Sudarshan, "Database Concepts". McGraw Hill.
- Majumdar & Bhattacharya, "Database Management System", Tata McGraw Hill.
- Date C J." An Introduction to Database Systems", Addision Wesley.

Data Structures using C LAB

Course Code	L	T	P	Credit	Semester
BCI223	0	0	2	1	II

Course Learning Outcomes:

CLO1: Investigate different concepts of Data Structure in terms of application or project development.
CLO2: Create methods and programs within the field of procedural programming as well as developing logical and analytical approaches to programming problems independently.
CLO3: Apply his/her knowledge in new areas within field of basic and advanced programming.
CLO4: Develop independently relevant applications using self logic in the field of programming languages. These methods include performing experiment/programs and interpreting their results.

LIST OF PRACTICALS

1. Write a program to generate Fibonacci Series, using recursion.
2. Write a program to calculate Factorial of nth number, using recursion.
3. Write a program to implement Tower of Hanoi, using recursion.
4. Write a program to calculate GCD of two numbers, using recursion.
5. Write a program to calculate power of a number, using recursion.
6. Write a program to reverse a given string, using recursion.
7. Write a program to swap two elements without using third variable.
8. Write a program to remove all the duplicate elements present in the given array.
9. Write a program to search an element using Linear Search.
10. Write a program to search an element using Binary Search.
11. Write a program to sort the given array using Bubble Sort.
12. Write a program to sort the given array using Selection Sort.
13. Write a program to sort the given array using Insertion Sort.
14. Write a program to insert a new element in the given unsorted array at k^{th} position.
15. Write a program to insert a new element in the given sorted array at proper place.

16. Write a program to delete an element from given sorted array.
17. Write a program to merge to given sorted arrays.
18. Write a program to perform addition of two matrices.
19. Write a program to perform multiplication of two matrices.
20. Write a program to check whether given matrix is diagonal matrix, upper triangular matrix, lower triangular matrix.
21. Write a program to find out transpose of a given matrix.
22. Write a program using array of pointers, sort the given array of strings, using bubble sort.
23. Write a program to implement Stack using array, also show overflow and underflow in respective push and pop operations.
24. Write a program to implement Queue using array, which shows insertion and deletion operations.
25. Write a program to implement Circular Queue using array, which shows insertion and deletion operations.
26. Write a program to implement Linear Linked List, showing all the operations, like creation, display, insertion, deletion and searching.
27. Write a program to implement Stack, using Linked List. Implement Push, Pop and display operations.
28. Write a program to implement Queue, using Linked List. Implement Insertion, deletion and display operations.
29. Write a program to count the number of times an item is present in a linked list.
30. Write a program to increment the data part of every node present in a linked list by 10. Display the data both before incrimination and after.
31. Write a program to implement Doubly Linked List, showing all the operations, like creation, display, insertion, deletion and searching.
32. Write a program to create a Binary Search Tree and display its contents using preorder, postorder and inorder traversal.
33. Write a program to implement insert, delete and search operations in a Binary Search Tree

Examination Scheme:

IA				**EE**	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS LAB

Course Code	L	T	P	Credit	Semester
BCI224	0	0	2	1	II

Course Learning Outcome:

CLO1: Understand, appreciate and effectively explain the underlying concepts of database technologies

CLO2: Design and implement a database schema for a given problem-domain

CLO3: Populate and query a database using SQL DML/DDL commands.

CLO4: Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS

CLO5: Programming PL/SQL including stored procedures, stored functions, cursors, packages.

LIST OF PRACTICALS

1) Create a table "PRODUCTS" with the below mentioned structure:
   Product ID NUMBER(11)
   Supplier ID NUMBER(11)
   Category ID NUMBER(11)
   Quantity Per Unit VARCHAR2(20)
   Unit Price NUMBER(11)
   Units In Stock NUMBER(11)
   Units On Order NUMBER(11)
   Product ID should be the Primary Key.

2) Consider the following tables:
   WORKS (Pname, Cname, Salary)
   LIVES (Pname, Street, City)

LOCATED_IN (Cname, City)
MANAGER (Pname, Mgrname)

Where Pname=Person name, Cname= Company name and Mgrname = Manager name.

Write the SQL for the following:

a) List the names of the people who work for the company Wipro along with the cities they live in.
b) Find the people who work for the company "Infosys" with a salary more than Rs. 50000/-. List the names of the people , along with the street and city addresses.
c) Find the names of the persons who live and work in the same city.
d) Find the names of the persons who dod not work for "Infosys".
e) Find the persons whose salaries are more than that of all of the "Oracle" employees.
f) Find the names of the companies that are located in every city where the company "Infosys" is located.

3) Create table EMP and DEPT with the below mentioned structure

Structure for EMP table

EmpID	NUMBER(4)
DeptID	VARCHAR2(10)
EmpName	CHAR(10)
Job	CHAR(10)
HireDate	DATE
Salary	NUMBER(7, 2)
Commission	NUMBER (7, 2)

Structure for DEPT table

DeptId	VARCHAR2(10)
Deptname	VARCHAR2(20)
No_of_Faculties	NUMBER(2)

In table EMP: EmpID should be the Primary Key and DeptID should be the foreign key.
In table DEPT: DeptId should be the primary key.

4) INSERT the following values in the EMP table:
   a) 1001,SET_01,Harrey,SE,01-Jan-2009,15000,3
   b) 1002,SET_02, Ron, SSE,15-Feb-1998,20000,4
   c) 1003,SEM_05, Peter, Manager,15-April-1999,40000,5
   d) 1002,SED_07, Jolie,Assistant Manager,15-Dec-1998,50000,5
   e) 1008,SET_08, Santy, SSE,15-Feb-2000,20000,4
   f) 1008,SED_10, San, SE,10-Feb-2009,22000,5

5) Considering the above table i.e EMP write the queries for the following:
   a) Find out the number of employees having "manager" as job.
   b) Display only the jobs with maximum salary greater than or equal to 3000
   c) Find all those employees whose job does not start with 'M'.
   d) Find the names of the employees whose name starts with 'S'.
   e) Find the names of the employees who are Managers and their date of joining is after "02-Jan-2006".
   f) For describing the structure of the EMP table and DEPT table.
   g) For getting the average salary of the employees from EMP table.
   h) For displaying the current date and give the column a name "DATE".
   i) For converting the name of the employee into uppercase where the employee name is "Santy"

j) Create a sequence with name SEQ_EMP , which will generate numbers from 1 to 99 in ascending order with an interval of 1. The sequence must start from 1 after generating the number 99.
k) Displaying the names of the employees who have ‘a’ and ‘e’ as a character in their names.

6) Considering the table DEPT in question 3, find the total number of departments.

7) Alter the EMP table for the changing the width of the field EmpID from 4 to 10.

8) Alter the DEPT table for changing the width of the field No_of_Faculties from 2 to 4.

9) Delete all the records from the EMP table where the EmpName starts with “S”,

10) Insert some values in the PRODUCTS table created in Question 1 and then DROP the table PRODUCTS.

11) Update the EMP table for the following values:
a) Increase the salary of all the employees by 10% where the job is SE and SSE.
b) Change the hiredate of the employee “Harry” to 01-Feb-2009.
c) Update the salary of the employees to an increase of 15% where deptid is SED_07.

12) Alter the table EMP for the following:
a) Add one more field in the table i.e DOB DATE
b) Drop the column named Commission from the EMP table.

13) Write a query to select all the records from the EMP table.

14) Write a query to select all the records from the DEPT table.

15) Write a query to select the distinct deptid from EMP table.

16) Write a query to find the name and salary of the employee from EMP table where the salary is maximum.

17) Create a view amed v_EMP on the table EMP,DEPT by selecting the following fields

Emp ID, Dept ID, Emp Name, Job

Where the EMP.Dept ID = DEPT. Dept Id.

18) Create a synonym S_EMP on the table EMP.

19) Write a PL/SQL program for:

a) Printing the Fibonacci series from 1 to 50.
b) Printing the smallest number among any three numbers.
c) Printing the table of any specific number entered.

20) Create a trigger named “Client_Master” which keeps track of records deleted or updated when such operations are carried out. Records in this table are inserted into table “Audit” when database trigger fires due to an update or delete statement fired on this table “Client”.

Table: Client

Column name	*Data type*	*Size*
Client_no	Varchar2	6
Name	Varchar2	20
Address	Varchar2	30
Balance_Due	Number	10,2

21) Write a sql query to drop the table EMP, can we drop a table with data in it.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

DOMAIN ELECTIVE

NETWORKING FOR HOME & SMALL BUSINESS

Course Code	L	T	P	Credit	Semester
BCI231	2	1	0	3	II

Course Learning Outcomes:

CLO1:Discuss the different types of personal computers and Operating Systems, how they are used, and the difference between local and network applications.
CLO2: Describes how communication occurs on an Ethernet network.
CLO3: Discuss Network Addressing and Services with IP address and subnet mask and how they are used on
a network. CLO4: Explores the benefits and limitations of wireless technology and where it is used. CLO5: Introduces networking threats, their characteristics, and different methods of attack.

Course Contents:

Module I: Personal Computer Hardware
Personal Computers and Applications, types of Computers, Binary Representation of Data, Computer Components and Peripherals, Computer System Components

Module II: Operating System
Choosing Operating Systems, Installing Operating System, Maintaining Operating System.

Module III: Connecting to the Networks
Introduction to Networking, Principals of Communication, Communicating on a Local Wired Network, Building the Access Layer of an Ethernet Network, Building the Distribution Layer of Network, Plan and Connect a Local Network

Module IV: Connecting to the Internet through ISP
The Internet and How We Connect To It Sending Information across the Internet, Networking Devices in a NOC Cables and Connectors Working with Twisted Pair Cabling

Module V: Network Addressing
Addresses and Subnet Masks, Types of IP Addresses, How IP Addresses are obtained Address Management

Module VI: Network Services
C/S & their interactions, Application Protocols & Services, Layered Model & Protocols

Module VII: Wireless Technologies
Wireless Technology, Wireless LANs, Security Considerations on a Wireless LAN Configuring an Integrated AP and Wireless Client

Module VIII: Basic Security
Networking Threats, Methods of attack, Security Policy, Using Firewalls

Module IX: Trouble Shooting your Network
Troubleshooting Process, Troubleshooting & Common Issues, Troubleshooting & Helpdesk

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- CCNA-Discovery 4.0, module 1, Cisco Certified Networking Academy
- Data Communication and Computer Network, Forozoun, TMH Publication
- Data Communication and Network, Stallings, PHI
- Computer Network, Tanenbaum, PHI

INTERNET FUNDAMENTALS

Course Code	L	T	P	Credit	Semester
BCI232	2	1	0	3	II

Course Learning Outcome:

CLO1: Understand the basics and underlying concepts of internet fundamentals
CLO2: Learn the basics of internet tools like email, online chat, scripting languages .
CLO3: Create awareness about the installation and use of web servers and security & privacy issues of internet

Course Contents:

Module 1: Internet Basics
Introduction to Internet, History of Internet, Internet Working, Modes of Connecting to Internet, Internet Service Providers(ISPs), Differentiate between Internet, Intranet and Extranet, Protocol, Internet address, IP addressing, standard address, domain name, DNS, internet tool, TCP/IP and UDP, OSI reference model.

Module 2: Electronic Mail
Introduction to E-mail, advantages and disadvantages of e-mails, structure of an e-mail address, message components, message composition, mailer features, Internal working of E-mail, E-mail management, MIME types, Newsgroups, mailing lists, chat rooms, secure-mails, SMTP,POP, PICO, Pine, Gopher.

Module 3: World Wide Web
Introduction to www, Miscellaneous Web Browser details, searching www: Search engines and meta search engines, search fundamentals, search strategies, working of search engines, Telnet, FTP, HTTP, Introduction to Browser, Coast-to-coast surfing, HTML, Web page installation and setup , Basics of HTML, formatting & hyperlink creation. Using and installing Plug-ins.

Module 4: Introduction to Languages and Servers
Basics of java script language, Client/Server Side Programming in java script, Using Forms and data entry using java script, XML and DHTML basics, Creating Static and dynamic web pages. Web Servers: PWS, IIS, Apache, Advantages and limitations of using these servers.

Module 5: Privacy and security
Introduction to security over internet, Network Attacks, security and privacy levels, security policy, virus worms and Trojan horses, Cryptography: Encryption and Decryption techniques, Secure Web document, Digital Signatures, Firewalls and its types, IDS.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Fundamentals of the Internet and the World Wide Web, Raymond Greenlaw and Ellen Hepp – 2001, TMH
- Internet & World Wide Programming, Deitel,Deitel & Nieto, 2000, Pearson Education
- Complete idiots guide to java script, Aron Weiss, QUE, 1997
- Atul Kahate, "Cryptography and Network Security", Tata McGraw-Hill, 2003

CYBER SECURITY

Course Code	L	T	P	Credit	Semester
BCI233	2	1	0	3	II

Course Learning Outcome:

CLO1: Explain the concepts of confidentiality, availability, and integrity (CIA) in context of Information Assurance

CLO 2: Analyze and evaluate the cyber security needs of an organization.

CLO 3: Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation.

CLO 4: Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools.

CLO5: Comprehend and execute risk management processes, risk treatment methods, and key risk and performance indicators

Course Contents:

Module I: Introduction to Cyber Security

Introduction to Cyber Security, Cyber Crime / Social Theories, Threats to security, Government requirements, Information Protection and Access Controls, Computer security efforts, Standards, Computer Security mandates and legislation, Privacy considerations, International security activity, Intrusion Detection , Malicious Software Use and Detection

Module II: Information Technology Law

The Information Technology Legal Framework in India, Cyber Crime, Digital Evidence, Technological Standards under the Information Technology Law, Liability of companies under the Information Technology Act

Module III: Network Security

Intrusion Detection & Prevention systems, Firewalls and Firewall Policy, Computer Security Log Management, Securing WiMAX Wireless Communications

Module IV: Information security

Fundamentals, Employee responsibilities, information classification, Information handling, Tools of information security, Information processing, secure program, administration.

Module V: Information Technology Act Compliance

IT Act compliance for e-Commerce Sector, Education Sector, Healthcare Sector, Hospitality Sector, Outsourcing Sector, Retail Sector

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Rick Lehtinen and G.T. Gangemi, Computer Security Basics**,** 2nd ed. (2006), O'Reilly Media Inc.

- McClure, Stuart & Scambray, Joel, Hacking Exposed 5th ed. et al (2005),, McGraw-Hill Osborne Media.
- Ortmeier, P. J., Security Management: An Introduction, 2nd ed. (2005), Prentice Hall.

Anandam

Course Code	L	T	P	Credit	Semester
AND002	2	0	0	2	II

Course Learning Outcome:

CLO1: Awareness and empathy regarding community issues
CLO2: Interaction with the community and impact on society
CLO3: Interaction with mentor and development of Student teacher relationship
CLO4: Interaction among students, enlarge social network
CLO5: Cooperative and Communication skills and leadership qualities Critical thinking, Confidence and Efficiency

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants, phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.
- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.
3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).

4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
6. For the topic chosen by the group, students are recommended to cover the following points:
    a) Current scenario (Regional, national and international level as applicable)
    b) Future predictions
    c) Duty of the government
    d) Government policies (related to the topic), if any
    e) Duty of public
    f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
3. Conclusion is clearly stated. The underlying logic is explicit.

ENGLISH

Course Code	L	T	P	Credit	Semester
BCS201	1	0	0	1	II

A. COURSE LEARNING OUTCOMES (CLO)

CLO 1	Participate in conversation and in small- and whole-group discussion
CLO 2	Explore and use English as medium of communication in real life situation

CLO 3	Discuss topics and themes of a reading, using the vocabulary and grammar of the lesson
CLO 4	Identify features of a reading textbook and utilize them as needed
CLO 5	Prepare and deliver organized presentations in small groups and to whole class
CLO 6	Apply sentence mechanics and master spelling of high frequency words

B. SYLLABUS

Developing Listening Skills
Developing Speaking Skills
Developing Reading Skills
Developing Writing Skills
Principles of Good Writing - L Hill
Toasted English -R. K. Narayan
On Saying Please- A G Gardiner
All the World's a Stage : Shakespeare
Where the Mind is without Fear: R N Tagore
O Captain, My Captain: W. Whitman
Psalm of Life: H. Longfellow
Go Kiss the World by Subroto Bagchi; Steve Jobs By Walter Isaacson; Rich Dad, Poor Dad by Robert Kiyosaki; The Road Ahead by Bill Gates; What You See, Is What You Get By Alan Sugar (Non detailed study; any of books)

EXAMINATION SCHEME:

Components	CT/Mid-term	Project/Presentation/ Assignment/Viva	Book Review	Quiz	Attendance	EE
Weightage (%)	15	10	10	10	5	50

SUGGESTED READINGS

Bhardwaj, Ashu. *A Course Book of English & Communication Skills*. Paragon: New Delhi,2011.

Farhanthullah, T M. *Communication Skills for Technical Students*. Orient Black PVT: 2008.

Jha, Madhulika. *Echoes.* Orient Blackswan: New Delhi, 2007.

Koneru, Aruna. *Professional Communication.* The McGraw Hill: New Delhi, 2008.

Prasad, Dr P. *The Functional Aspects of Communication Skills*.SK & Sons: New Delhi, 2003.

Raman, Meenakshi and Sangeeta Sharma, *Technical Communication: Principles and Practice.* OUP: New Delhi, 2004.

BEHAVIOURAL SCIENCE - II
(PROBLEM SOLVING AND CREATIVE THINKING)

Course Code	L	T	P	Credit	Semester
BSS203	1	0	0	1	II

Course Learning Outcome:

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1. Recognize the relation critical thinking with various mental processes.
2. Identify hindrance to problem solving processes.
3. Analyze the steps in problem-solving process.
4. Create plan of action applying creative thinking.

Course Contents:

Module I: Thinking as a tool for Problem Solving
What is thinking: The Mind/Brain/Behaviour
Thinking skills
Critical Thinking and Learning:
Making Predictions and Reasoning
Memory and Critical Thinking
Emotions and Critical Thinking

Module II: Hindrances to Problem Solving
Perception
Expression
Emotion
Intellect
Work environment

Module III: Problem Solving Process
Recognizing and Defining a problem
Analyzing the problem (potential causes)
Developing possible alternatives
Evaluating Solutions
Resolution of problem
Implementation

Module IV: Plan of Action
Construction of POA
Monitoring
Reviewing and analyzing the outcome

Module V: Creative Thinking
Definition and meaning of creativity
The nature of creative thinking
Convergent and Divergent thinking
Idea generation and evaluation (Brain Storming)
Image generation and evaluation
Debating
The six-phase model of Creative Thinking: ICEDIP model

Examination Scheme:

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
Weightage (%)	20	05	20	30	25

Text & References:

- Michael Steven: How to be a better problem solver, Kogan Page, New Delhi, 1999

- Geoff Petty: How to be better at creativity; Kogan Page, New Delhi, 1999
- Phil Lowe Koge Page: Creativity and Problem Solving, New Delhi, 1996
- Bensley, Alan D.: Critical Thinking in Psychology – A Unified Skills Approach, (1998), Brooks/Cole Publishing Company.

FRENCH – II

Course Code	L	T	P	Credit	Semester
FLT201	2	0	0	2	II

.**Course Learning Outcome:**

CLO1:Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
CLO2:Students will be able to read and interpret small texts .
CLO3:Students will be able to communicate in small sentences in writing, self introduction, family description etc.
CLO4:Students will be able to communicate in small sentences in oral, self introduction, family description etc

Course Contents:

Module A: pp.38 – 47: Unité 3: Objectif 3, 4, 5. 6

Module B: pp. 47 to 75 Unité 4, 5

Contenu lexical: **Unité 3: Organiser son temps**

1. donner/demander des informations sur un emploi du temps, un horaire SNCF – Imaginer un dialogue
2. rédiger un message/ une lettre pour …
   i) prendre un rendez-vous/ accepter et confirmer/ annuler
   ii) inviter/accepter/refuser
3. Faire un programme d'activités
   imaginer une conversation téléphonique/un dialogue
   Propositions- interroger, répondre

Unité 4: **Découvrir son environnement**

1. situer un lieu
2. s'orienter, s'informer sur un itinéraire.
3. Chercher, décrire un logement
4. connaître les rythmes de la vie

Unité 5: s'informer

1. demander/donner des informations sur un emploi du temps passé.
2. donner une explication, exprimer le doute ou la certitude.
3. découvrir les relations entre les mots
4. savoir s'informer

Contenu grammatical:

1. Adjectifs démonstratifs
2. Adjectifs possessifs/exprimer la possession à l'aide de:
   i. « de » ii. A+nom/pronom disjoint
3. Conjugaison pronominale – négative, interrogative - construction à l'infinitif
4. Impératif/exprimer l'obligation/l'interdiction à l'aide de « il faut…. »/ «il ne faut pas… »
5. passé composé
6. Questions directes/indirectes

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1

GERMAN – II

Course Code	L	T	P	Credit	Semester
FLG201	2	0	0	2	II

Course Learning Outcome:

CLO1: Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
CLO2:Students will be able to read and interpret small texts .
CLO3:Students will be able to communicate in small sentences in writing, self introduction, family description etc.
CLO4:Students will be able to communicate in small sentences in oral, self introduction, family description etc.

Course Contents:

Module I: Everything about Time and Time periods
Time and times of the day.
Weekdays, months, seasons.
Adverbs of time and time related prepositions

Module II: Irregular verbs
Introduction to irregular verbs like to be, and others, to learn the conjugations of the same, (fahren, essen, lessen, schlafen, sprechen und ähnliche).

Module III: Separable verbs
To comprehend the change in meaning that the verbs undergo when used as such
Treatment of such verbs with separable prefixes

Module IV: Reading and comprehension
Reading and deciphering railway schedules/school time table
Usage of separable verbs in the above context

Module V: Accusative case
Accusative case with the relevant articles
Introduction to 2 different kinds of sentences – Nominative and Accusative

Module VI: Accusative personal pronouns
Nominative and accusative in comparison
Emphasizing on the universal applicability of the pronouns to both persons and objects

Module VII: Accusative prepositions
Accusative propositions with their use
Both theoretical and figurative use

Module VIII: Dialogues
Dialogue reading: 'In the market place'
'At the Hotel'

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch

- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH – II

Course Code	L	T	P	Credit
FLS201	2	0	0	2

Course Learning Outcome:

CLO1: Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
CLO2: Students will be able to read and interpret small texts .
CLO3: Students will be able to communicate in small sentences in writing, self introduction, family description etc.
CLO4:Students will be able to communicate in small sentences in oral, self introduction, family description etc.

Course Contents:

Module I
Revision of earlier modules.

Module II
Some more AR/ER/IR verbs. Introduction to root changing and irregular AR/ER/IR ending verbs

Module III
More verbal phrases (eg, Dios Mio, Que lastima etc), adverbs *(bueno/malo, muy, mucho, bastante, poco).*
Simple texts based on grammar and vocabulary done in earlier modules.

Module IV
Possessive pronouns

Module V
Writing/speaking essays like my friend, my house, my school/institution, myself….descriptions of people, objects etc, computer/internet related vocabulary

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras

CHINESE– II

Course Code	L	T	P	Credit
FLC201	2	0	0	2

Course Learning Outcome:

CLO1. Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
CLO2. Students will be able to read and interpret small texts .
CLO3. Students will be able to communicate in small sentences in writing, self introduction, family description etc.
CLO4. Students will be able to communicate in small sentences in oral, self introduction, family description etc.

Course Contents:

Module I

Drills, Practice reading aloud, Observe Picture and answer the question, Tone practice, Practice using the language both by speaking and by taking notes, Introduction of basic sentence patterns, Measure words, Glad to meet you.

Module II

Where do you live?, Learning different colors, Tones of "bu", Buying things and how muchit costs?, Dialogue on change of Money, More sentence patterns on Days and Weekdays.
How to tell time. Saying the units of time in Chinese. Learning to say useful phrases like – 8:00, 11:25, 10:30 P.M. everyday, afternoon, evening, night, morning 3:58, one hour, to begin, to end ….. etc.
Morning, Afternoon, Evening, Night.

Module III

Use of words of location like-li, wais hang, xia
Furniture – table, chair, bed, bookshelf,.. etc.
Description of room, house or hostel room.. eg what is placed where and how many things are there in it?
Review Lessons – Preview Lessons, Expression 'yao", "xiang" and "yaoshi" (if).
Days of week, months in a year etc., I am learning Chinese. Is Chinese difficult?

Module IV

Counting from 1-1000, Use of "chang-chang".
Making an Inquiry – What time is it now? Where is the Post Office?
Days of the week. Months in a year.
Use of Preposition – "zai", "gen".
Use of interrogative pronoun – "duoshao" and "ji".
"Whose"??? Sweater etc is it?
Different Games and going out for exercise in the morning.

Module V

The verb "qu"
– Going to the library issuing a book from the library
– Going to the cinema hall, buying tickets
– Going to the post office, buying stamps
– Going to the market to buy things.. etc
– Going to the buy clothes …. Etc.
Hobby. I also like swimming.
Comprehension and answer questions based on it.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- "Elementary Chinese Reader Part I" Lesson 11-20

DIGITAL & COMPUTER ORGANIZATION

Course Code	L	T	P	Credit	Semester
BSI301	2	1	0	3	III

Course Learning Outcome:

CLO1: Perform basic arithmetic calculations in binary, decimal and hexadecimal number system.
CLO2: Investigate, analyse and synthesise combinational logic circuits and how basic computer components are specified.
CLO3: Analyse the operation of short assembly language programs.

CLO4: Formulate and employ a Karnaugh Map to reduce Boolean expressions and logic circuits to their simplest forms

Course Contents:

Module I: Digital Logic Fundamentals
Boolean Algebra: Basic Functions, Manipulating Boolean functions, Basic Combinational Logic: Adder / Subtractor, Decoders, Encoders, Multiplexers, Memory, Basic Sequential Circuits: Flip-flops, Registers, Counters.

Module II: General Computer Architecture
Block Diagram of typical Computer, Memory Section, Input / Output Section, CPU, Registers, Arithmetic Unit, Instruction handling Areas, Stacks
Micro operations: Register Transfer, Bus and Memory Transfer, Arithmetic Micro operations, Logic Micro operations, Shift Micro operations, Arithmetic Logic Shit Unit

Module III: Basic Computer Organization and Design
Instruction Codes, Operation code, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input Output Instructions and Interrupts
Control Memory: Control Word, Microinstruction, Microprogramming, Control Memory, Hardwired

Module IV: Central Processing Unit
General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, RISC, CISC
Pipelining and Vector Processing: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, Vector Processing, Array Processors

Module V: Input Output Organization
I/O Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA, IOP, Serial Communication
Memory Organization: Associative Memory, Cache Memory, Virtual Memory

Module VI: Introduction to Microprocessor
Machine Language, Assembly Language, Assembler, High Level Language, Compiler, Interpreter, Internal Architecture 8085.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Computer System Architecture, M.M. Mano, Pearson Education.
- Computer Architecture and Organization, J.P Hayes, TNH.
- Lance A Leventhal Introduction to Microprocessors: Software, Hardware, Programming
- Hwang and Briggs Computer Architecture and Parallel Processing

INTRODUCTION TO INFORMATION SYSTEMS

Course Code	L	T	P	Credit	Semester
BSI302	2	1	0	3	III

Course Learning Outcome:

CLO1: Identify different information concepts and approaches in information system.

CLO2: Analyse and critically evaluate various information concepts which will help in understanding of different information systems.

CLO3: Select and implement different approaches which help in understanding information system concepts in project or application development.

CLO4: Demonstrate awareness of information paradigm in terms of understanding the concept of information system as a whole.

Course Contents:

Module 1

Core concepts: Information, data and systems, Value of Information, types of information, types of data, types of systems, Elements of system: Input, Processing, Output, & Feedback. Contemporary trends in information & communication tech., Networking Technologies

Information systems: Definition, Components of Information Systems, types of information system in organization, Computer-Based Information Systems, Business Information Systems, The People in Information Systems, ERP system

Module II

Transaction Processing Systems, Features of TPS, Management information systems (MIS), Decision Support System (DSS), Executive information systems (EIS), Office information systems (OIS), Knowledge work systems (KWS) and knowledge management systems (KMS), Computers in industrial processes, E-commerce, social and economic context of computer use, Data protection and computer crime

Module III

Development of information systems, Where to start: build, buy, rent or participate?, Approaches to the work of systems development, RAD software development, Organizational change, The information system lifecycle, Professional roles in systems development, Reviewing the lifecycle model, CASE Tools

Module IV

Tools and methods for analysis and design, object oriented modeling, Class diagrams and data models, implementation methodology, change management

Module V
Globalization, Global Firm, challenges of globalization, IT role in globalization, Network Society, Digital Divide, Nielsen's 3 stages of the digital divide, Consequences of digital technology, OLPC project-Case Study, Information Systems Security

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Fundamentals of Information Systems, Ralph Stair, George Reynolds, Course Technology; 7 edition
- Information Systems for Business and Beyond, David T. Bourgeois, the Saylor Academy, 2014
- Introduction to information systems, T. Cornford, M. Shaikh, University of London, 2013

OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++

Course Code	L	T	P	Credit	Semester
BCI303	2	1	0	3	III

Course Learning Outcome:

CLO1:Investigate different concepts of programming approaches in terms of the application or project development.

CLO2:Create methods and programs within the field of procedural programming as well as developing logical and analytical approaches to programming problems independently.

CLO3:Apply his/her knowledge in new areas within the field of basic and advanced programming.

CLO4Develop independently relevant applications using self logic in the field of programming languages. These methods include performing experiments/programs and interpreting their results.

Course Contents:

Module I: Overview of C++
What is Object Oriented Programming, Characteristics of OOP, Difference between C and C++.
Basics:-Input/Output in C++ using cin/cout, Preprocessor Directives, Data Types-Integer, Float, character, Enumerated data types, library functions, comments, storage classes, manipulators, type conversion, arithmetic operators, arrays and strings

Module II: Loops and Decisions
Relational operators, Logical operators, Decisions-if, if-else and switch. Loops-for, while, do-while and nested loops, precedence summary, break, continue and goto statements.
Functions: Simple functions, passing arguments to functions, returning values from functions, reference arguments, returning by reference, Overloaded functions, Inline functions

Module III: Structures
A simple Structure, specifying the Structure, defining the structure variable, assessing members of structure, structure within structure, assessing structure members using pointers

Classes and objects: A simple class, C++ objects as physical objects, Constructors, Destructors, objects as function arguments, returning objects from functions, static class data, array as class data member, array of objects.

Module IV: Operator Overloading & Inheritance
Overloading unary operator, Overloading binary operator, data conversion. Inheritance: Derived and Base class, Derived class Constructor, types of Inheritance , Abstract base class , public and private Inheritance, level of Inheritance, Ambiguity in multiple inheritance .

Module V: Pointers and Virtual functions
Pointers and Arrays, pointers and strings, pointers and functions, pointers to objects, virtual functions, friend functions, static functions, this pointer.
Files and Streams: streams, string I/O, character I/O, object I/O, file pointer, error handling, command line arguments.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:
- Programming with C++, Ravi Chandran
- Mastering C++, Venugopal
- Programming in C++, SCHAUM's series
- The complete reference C++, Herbert Schildt

OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++ LAB

Course Code	L	T	P	Credit	Semester
BCI323	0	0	2	1	III

Course Learning Outcome:

CLO1: Read and understand Object oriented-based software code of medium-to-high complexity.

CLO2. Use standard and different type of Object oriented libraries when required for implementation.
CLO3: Understand the basic principles of creating Object oriented applications or program.

CLO4. Understand the fundamental concepts of computer science: structure of the computational process, algorithms and complexity of computation.

LIST OF PRATICALS

1. WAP to find greatest of three numbers.
2. WAP to calculate factorial of a number.
3. WAP to print Fibonacci series of 'n' numbers , where n is given by the programmer
4. WAP to check whether a number is prime or not.
5. WAP to find the number of characters and words in a string.
6. WAP to read a set of numbers in an array & to find the largest of them.
7. WAP to implement bubble sort using arrays.
8. WAP to read a set of numbers from keyboard & to find sum of all elements of the given array using a function.

9. WAP to exchange contents of two variables using call by value.
10. WAP to exchange contents of two variables using call by reference.
11. WAP to find the sum of three numbers using pointer to function method.
12. WAP to display content of an array using pointer arithmetic.
13. Calculate area of different geometrical figures (circle, rectangle, square, triangle) using function overloading.
14. WAP a program ro maintain the student record containing roll number , Name, marks1, marks2, marks3 as data member and getdata(), display() and setdata() as member functions(use array of object)
15. WAP to increment the employee salaries on the basis of there designation (Manager-5000, General Manager-10000, CEO-20000, worker-2000). Use employee name, id, designation, salary as data member and inc_sal as member function (Use array of object).
16. Write a class bank, containing data member: Name of Depositor, A/c type, Type of A/c, Balance amount. Member function: To assign initial value, To deposit an amount, to withdraw an amount after checking the balance (which should be greater than Rs. 500) , To display name & balance.
17. WAP to define nested class 'student_info' which contains data members such as name, roll number and sex and also consists of one more class 'date' ,whose data members are day, month and year. The data is to be read from the keyboard & displayed on the screen.
18. WAP to generate a series of Fibonacci numbers using copy constructor, where it is defined outside the class using scope resolution operator.
19. Write a program to add two complex numbers using friend function.
20. Write a class string to compare two strings, overload (= =) operator.
21. Write a class to concatenate two strings, overload (+) operator.
22. Create a class item, having two data members x & y, overload '-'(unary operator) to change the sign of x and y.
23. Create a class Employee. Derive 3 classes from this class namely, Programmer, Analyst & Project Leader. Take attributes and operations on your own. Write a program to implement this with array of pointers.
24. Create two classes namely Employee and Qualification. Using multiple inheritance derive two classes Scientist and Manager. Take suitable attributes & operations. Write a program to implement this class hierarchy.
25. Write a program to read data from keyboard & write it to the file. After writing is
26. Completed, the file is closed. The program again opens the same file, reads

Examination Scheme:

IA	EE

A	PR	LR	V	PR	V
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ENVIRONMENTAL STUDIES

Course Code	L	T	P	Credit
EVS001	4	0	0	4

Course Objective:
The term environment is used to describe, in the aggregate, all the external forces, influences and conditions, which affect the life, nature, behaviour and the growth, development and maturity of living organisms. At present a great number of environment issues, have grown in size and complexity day by day, threatening the survival of mankind on earth. A study of environmental studies is quite essential in all types of environmental sciences, environmental engineering and industrial management. The objective of environmental studies is to enlighten the masses about the importance of the protection and conservation of our environment and control of human activities which has an adverse effect on the environment.

Course Contents:

Module I: The multidisciplinary nature of environmental studies
Definition, scope and importance
Need for public awareness

Module II: Natural Resources
Renewable and non-renewable resources:
Natural resources and associated problems
Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.
Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

Module III: Ecosystems
Concept of an ecosystem
Structure and function of an ecosystem
Producers, consumers and decomposers
Energy flow in the ecosystem
Ecological succession
Food chains, food webs and ecological pyramids
Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem
b. Grassland ecosystem
c. Desert ecosystem
d. Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries)

Module IV: Biodiversity and its conservation
Introduction – Definition: genetic, species and ecosystem diversity

Biogeographical classification of India
Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and option values
Biodiversity at global, national and local levels
India as a mega-diversity nation
Hot-spots of biodiversity
Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts
Endangered and endemic species of India
Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

Module V: Environmental Pollution
Definition
- Causes, effects and control measures of:
  a. Air pollution
  b. Water pollution
  c. Soil pollution
  d. Marine pollution
  e. Noise pollution
  f. Thermal pollution
  g. Nuclear pollution

Solid waste management: Causes, effects and control measures of urban and industrial wastes.
Role of an individual in prevention of pollution.
Pollution case studies.
Disaster management: floods, earthquake, cyclone and landslides.

Module VI: Social Issues and the Environment
From unsustainable to sustainable development
Urban problems and related to energy
Water conservation, rain water harvesting, watershed management
Resettlement and rehabilitation of people; its problems and concerns. Case studies.
Environmental ethics: Issues and possible solutions
Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
Wasteland reclamation
Consumerism and waste products
Environmental Protection Act
Air (Prevention and Control of Pollution) Act
Water (Prevention and control of Pollution) Act
Wildlife Protection Act
Forest Conservation Act
Issues involved in enforcement of environmental legislation
Public awareness

Module VII: Human Population and the Environment
Population growth, variation among nations
Population explosion – Family Welfare Programmes
Environment and human health
Human Rights
Value Education
HIV / AIDS
Women and Child Welfare
Role of Information Technology in Environment and Human Health
Case Studies

Module VIII: Field Work

Visit to a local area to document environmental assets-river / forest/ grassland/ hill/ mountain.
Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
Study of common plants, insects, birds
Study of simple ecosystems-pond, river, hill slopes, etc (Field work equal to 5 lecture hours)

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
- Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad 380 013, India, Email:mapin@icenet.net (R)
- Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
- Clark R.S., Marine Pollution, Clanderson Press Oxford (TB)
- Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p
- De A.K., Environmental Chemistry, Wiley Eastern Ltd.
- Down to Earth, Centre for Science and Environment (R)
- Gleick, H.P. 1993. Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford Univ. Press. 473p
- Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
- Heywood, V.H & Waston, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press 1140p.
- Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi 284 p.
- Mckinney, M.L. & School, R.M. 1996. Environmental Science Systems & Solutions, Web enhanced edition. 639p.
- Mhaskar A.K., Matter Hazardous, Techno-Science Publication (TB)
- Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
- Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA, 574p
- Rao M N. & Datta, A.K. 1987. Waste Water treatment. Oxford & IBH Publ. Co. Pvt. Ltd. 345p.
- Sharma B.K., 2001. Environmental Chemistry. Geol Publ. House, Meerut
- Survey of the Environment, The Hindu (M)
- Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Science
- Trivedi R.K., Handbook of Environmental Laws, Rules Guidelines, Compliances and Standards, Vol I and II, Enviro Media (R)
- Trivedi R. K. and P.K. Goel, Introduction to air pollution, Techno-Science Publication (TB)
- Wanger K.D., 1998 Environnemental Management. W.B. Saunders Co. Philadelphia, USA 499p

DOMAIN ELECTIVE
WORKING AT A SMALL-TO-MEDIUM BUSINESS OR ISPs

Course Code	L	T	P	Credit	Semester
BCI331	2	1	0	3	III

Course Learning Objective:

CLO1: What are the objectives of SME?
CLO2: The objectives of the small scale industries are: To create more employment opportunities. To help develop the rural and less developed regions of the economy.
CLO3: To reduce regional imbalances

Course Contents:

Module I: The Internet and Its Uses
What is the Internet, Internet Service Providers, and ISP Connectivity

Module II: ISP Help Desk
Help Desk Technicians, OSI Model, ISP Troubleshooting

Module III: Planning a Network Upgrade
Common Issues, Planning the Network Upgrade, Purchasing and Maintaining Equipment

Module IV: Planning the addressing structure
IP Addressing in the LAN, NAT and PAT

Module V: Configuring Network Devices
Initial ISR Router Configuration, Configuring an ISR with SDM, Configuring a Router Using IOS CLI, Initial Cisco 2960 Switch Configuration, Connecting the CPE to the ISP

Module VI: Routing
Enabling Routing Protocols, Exterior Routing Protocols

Module VII: ISP Services
Introducing ISP Services, Protocols that Support ISP Services, Domain Name Service Services and Protocols

Module VIII: ISP Responsibilities
ISP Security Considerations, Security Tools, Monitoring and Managing the ISP
Backups and Disaster Recovery

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- CCNA-Discovery 4.0, module 2, Cisco Certified Networking Academy
- Data Communication and Computer Network, Forozoun, TMH Publication
- Data Communication and Network, Stallings, PHI
- Computer Network, Tanenbaum, PHI

WEB DESIGNING

Course Code	L	T	P	Credit	Semester
BCI332	2	1	0	3	III

Course Learning Outcome:

CLO1: Apply critical thinking and problem solving skills required to successfully design and implement a web site.
CLO2: Demonstrate the ability to analyze, identify and define the technology required to build and implement a web site.
CLO3: Understand the importance of web development and web hosting.

Course Contents:

Module I: Introduction to HTML

HTML Definition, Structure of HTML Document, HTML Elements, Web Browser, HTML History, HTML Editors, <!DOCTYPE> Declaration, Using Background Image, Marquee Tag, Headings, Paragraphs, Nested HTML Elements, Empty HTML Elements, HTML Attributes, HTML Styles, HTML Layout Elements and Techniques, HTML Symbol Entities Using Emojis in HTML, HTML Character Entities, HTML Text Formatting, Colors, Quotation and Citation Elements, HTML Comments Tags.

Module II: Introduction to HTML (contd…)

Hyper Links and Bookmarks, Images and Image Mapping and Its attributes, Tables and its attributes, Table Spacing and Padding, Rowspan, Colspan, Table Layout, Ordered Lists, Unordered Lists, Definition List, Nested Lists, Forms and its controls and attributes, IFrame, HTML Graphics, HTML Media.

Module III: Introduction to CSS

What is CSS, Inline CSS, Internal CSS, External CSS, CSS Color, Font, Sizes, CSS Border, CSS Padding, CSS Margins, Block Level Elements and Inline Elements, Class, ID, DIV, SPAN

Module IV: Working with Graphics and Images

Graphics, Images, Types of Images, Modifying the Brightness, Contrast, Size of Images, Changing the Image Resolution (dpi), SVG Intro, SVG in HTML, SVG Rectangle, SVG Circle, SVG Ellipse, SVG Line, SVG Polygon, SVG Polyline, SVG Path, SVG Text, SVG Stroking, SVG Filter Intro, SVG Blur Effects, SVG Drop Shadow, SVG Linear, SVG Radial.

Module V: Web Hosting

Web Hosting Basics, Types of Hosting Packages, Registering domains, Defining Name Servers, Using Control Panel, Creating Emails in Cpanel, Using FTP Client, Maintaining a Website

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- HTML, DHTML, JavaScript, Perl, CGI, Ivan Bayross, BPB Publication.
- HTML Complete Reference, BPB Publication.
- Internet for everyone, Alexis Leon and Mathew Leon, Leon Tech world.

ADVANCE TECHNOLOGIES IN COMPUTER SCIENCE

Course Code	L	T	P	Credit	Semester
BCI333	2	1	0	3	III

Course Learning Outcome:

CLO 1: Recognize current and emerging disruptive technologies and their potential to impact social conditions, the economy, and daily life.

CLO 2: Compare and contrast current and emerging technologies and their implications for social ethics and the global workplace.

CLO 3: Appreciate the unique characteristics of and differences between disruptive technologies and their impacts.

CLO 4: Recognize the importance of ethical practices with new technologies.

CLO 5: Design a project plan that incorporates a new and emerging technology and illustrates its impact on organizations and industries.

Course Contents

Module I: Soft Computing

Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing.

Module II: Green Computing

Introduction to Green Computing, Websites, statistics, and government initiatives, Reducing the IT footprint, Computing technology for greener transportation, smarter buildings, Major green initiatives: Sustainable IT, Green Business, Smarter Plant

Module III: Internet of Things

Introduction – Concepts behind the Internet of Things, Trends and characteristics, Technologies behind the Internet of Things, Creative thinking techniques, application areas

Module IV: Civic technology

Civic technology, Smart city, e-democracy, open data, intelligent environment

Module V: Emerging Technologies

Brief introduction to emerging technologies: Quantum Computing, Parallel Computing, Pervasive Computing, High Performance Computing, Cluster computing, cloud computing, Super Computing

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Internet and Emerging Technologies 2nd Edition, by FADAIRO SIKIRUA (Author), MOORNING KIM
- Advanced Technologies: Building in the Computer Age (The Information Technology Revolution in Architecture) Paperback – June 1, 2001 by Valerio Travi

E-GOVERNANCE

Course Code	L	T	P	Credit
BSI334	2	1	0	3

Course Learning Outcomes:

CLO1: Understand the concept of e-governance. CLO2 Undwestand the different Models of E-Governance CLO3: Understand the concept of data ware hose and data mining.

Module 1. Introduction
E-Governance: Needs of E-Governance, Issues in E-Governance applications and the Digital Divide; Evolution of E-Governance, Its scope and content; Present global trends of growth in E-Governance: Other issues.

Module 2. Models of E-Governance
Introduction; Model of Digital Governance: Broadcasting/ Wilder Dissemination Model, Critical Flow Model, Comparative Analysis Model, Mobilization and Lobbying Model, Interactive-service Model/Government-to-Citizen-to-Government Model (G2C2G); Evolution in E-Governance and Maturity Models: Five Maturity Levels, Characteristics of Maturity Levels, Key areas, Towards Good Governance through E-Governance Models.

Module 3. E-Governance Infrastructure and Strategies
E-readiness: Digital System Infrastructure, Legal Infrastructural Preparedness, Institutional Infrastructural Preparedness, Human Infrastructural Preparedness, Technological Infrastructural Preparedness; Evolutionary Stages in E-Governance.

Module 4. Data Warehousing and Data Mining in Government
Introduction; National Data Warehouses: Census Data, Prices of Essential Commodities; Other areas for Data Warehousing and Data Mining: Agriculture, Rural Development, Health, Planning, Education, Commerce and Trade, Other Sectors.

Module 5. Case Studies
Nepalese Context: Cyber Laws, Implementation in the Land Reform, Human Resource Management Software; India: NICNET, Collectorate, Computer-aided Administration of Registration Department (CARD), Smart Nagarpalika, National Reservoir Level and

Capacity Monitoring System, Computerization in Andra Pradesh, Ekal Seva Kentra, Sachivalaya Vahini, Bhoomi, IT in Judiciary, E-Khazana, DGFT, PRAJA, E-Seva, E-Panchyat, General Information Services of National Informatics Centre; E-Governance initiative in USA; E-Governance in China; E-Governance in Brazil and Sri Lanka.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

1. E-Governance: Concepts and Case Studies, C.S.R. Prabhu, Prentice-Hall of India Private Limited, 2004.
2. Backus, Michiel, e-Governance in Developing Countries, IICD Research Brief, No. 1, March 2001.

SUMMER PROJECT – I (EVALUATION)

Course Code	L	T	P	Credit	Semester
BSI351	0	0	0	3	III

Course Learning Outcome:

CO1. Identify, Define and justify the scope of the proposed problem

CO2. Propose an optimized solution among the existing solutions

CO3. Apply to code, debugging, and testing tools for implementation

CO4. Prepare the proper documentation for report writing and oral presentation.

Guidelines:

There are certain phases of every Intern's professional development that cannot be effectively taught in the academic environment. These facets can only be learned through direct, on-the-job experience working with successful professionals and experts in the field. The internship program can best be described as an attempt to institutionalize efforts to bridge the gap between the professional world and the academic institutions. Entire effort in internship is in terms of extending the program of education and evaluation beyond the classroom of a university or institution. The educational process in the internship course seeks out and focuses attention on many latent attributes, which do not surface in the normal classroom situations. These attributes are intellectual ability, professional judgment and decision-making ability, inter-disciplinary approach, skills for data handling, ability in written and oral presentation, sense of responsibility etc.

In order to achieve these objectives, each student will maintain a file (**Internship File**). The Internship File aims to encourage students to keep a personal record of their learning and achievement throughout the Programme. It can be used as the basis for lifelong learning and for job applications. Items can be drawn from activities completed in the course modules and from the workplace to demonstrate learning and personal development.

The File will assess the student's analytical skills and ability to present supportive evidence, whilst demonstrating understanding of their organization, its needs and their own personal contribution to the organization.

The **layout guidelines** for the Project & Seminar Report:

1. File should be in the following specification:

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components
Front Page
Table of Content
Acknowledgement
Student Certificate
Company Profile (optional)
Introduction
Main Body
References / Bibliography

The File will include ***five sections*** in the order described below. The content and comprehensiveness of the main body and appendices of the report should include the following:

1. **The Title Page**--Title - An Internship Experience Report For (Your Name), name of internship organization, name of the Supervisor/Guide and his/her designation, date started and completed, and number of credits for which the report is submitted.
2. **Table of Content**--an outline of the contents by topics and subtopics with the page number and location of each section.
3. **Introduction**--short, but should include how and why you obtained the internship experience position and the relationship it has to your professional and career goals.
4. **Main Body**--should include but not be limited to daily tasks performed. Major projects contributed to, dates, hours on task, observations and feelings, meetings attended and their purposes, listing of tools and materials and their suppliers, and photographs if possible of projects, buildings and co-workers.
5. **References / Bibliography** --This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system

ASSESSMENT OF THE INTERNSHIP FILE

The student will be provided with the Student Assessment Record (SAR) to be placed in front of the Internship File. Each item in the SAR is ticked off when it is completed successfully. The faculty will also assess each item as it is completed. The SAR will be signed by the student and by the faculty to indicate that the File is the student's own work. It will also ensure regularity and meeting the delaines.

STUDENT ASSESSMENT RECORD (SAR)

1. **Range of Research Methods used to obtain information**

2. **Execution of Research**

3. **Data Analysis**

- Analyse Quantitative/ Qualitative information
- Control Quality

4. Draw Conclusions

Examination Scheme:

Components	**V**	**S**	**R**	**FP**
Weightage (%)	20	20	20	40

V – Viva, S – Synopsis, FP – Final Presentation, R - Report

Anandam

Course Code	L	T	P	Credit	Semester
AND003	2	0	0	2	III

Course Learning Outcome:

CLO1: Awareness and empathy regarding community issues
CLO2: Interaction with the community and impact on society
CLO3: Interaction with mentor and development of Student teacher relationship
CLO4: Interaction among students, enlarge social network
CLO5: Cooperative and Communication skills and leadership qualities Critical thinking, Confidence and Efficiency

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants, phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.
- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.
3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
6. For the topic chosen by the group, students are recommended to cover the following points:

a) Current scenario (Regional, national and international level as applicable)
b) Future predictions
c) Duty of the government
d) Government policies (related to the topic), if any
e) Duty of public
f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
3. Conclusion is clearly stated. The underlying logic is explicit.

COMMUNICATION SKILLS - I

Course Code	L	T	P	Credit	Semester
BCS301	1	0	0	1	III

A. COURSE LEARNING OUTCOMES (CLO)

CLO 1	Inculcating creative thinking skills

CLO 2	Construct and showcase their communication skills in a creative manner.
CLO 3	Comprehending and demonstrating ways of self-introduction
CLO 4	Outlining and illustrating presentation Skills

B. SYLLABUS

Topic
Self-Actualization (Baseline, Self-Image Building, SWOT, Goal Setting)
Telephone Etiquette
GD-1 (Basics, Do's & Don'ts, Mannerism, Dynamics, GD Markers)
Book Review Presentation

EXAMINATION SCHEME:

Components	Self Introduction	GD	Book Review Presentation	Attendance
Weightage (%)	30	35	30	5

SUGGESTED READINGS

- Business Communication, Raman – Prakash, Oxford
- Creative English for Communication, Krishnaswamy N, Macmillan
- Textbook of Business Communication, Ramaswami S, Macmillan
- Writing Skills, Coe/Rycroft/Ernest, Cambridge

BEHAVIOURAL SCIENCE - III
(INTERPERSONAL COMMUNICATION AND RELATIONSHIP MANAGEMENT)

Course Code	L	T	P	Credit	Semester
BSS303	1	0	0	1	III

Course Learning Outcome:

1. Demonstrate knowledge of strategies for developing a healthy interpersonal communication
2. Recognize the importance of transactional analysis, script analysis
3. Identify the difference between healthy and unhealthy expression of emotions and develop emotional competence necessary for conflict resolution and impression management.
4. Demonstrate knowledge of strategies for developing a healthy interpersonal relationship.

Course Contents:

Module I: Interpersonal Communication
Importance of Behavioural/ Interpersonal Communication
Types – Self and Other Oriented
Rapport Building – NLP, Communication Mode
Steps to improve Interpersonal Communication

Module II: Interpersonal Styles
Transactional Analysis
Life Position/Script Analysis
Games Analysis
Interactional and Transactional Styles
Bridging differences in Interpersonal Relationship through TA
Communication Styles

Module III: Conflict Management and Negotiation
Meaning and Nature of conflicts
Styles and techniques of conflict management
Meaning of Negotiation
Process and Strategies of Negotiation
Interpersonal Communication: Conflict Management and Negotiation

Module IV: Interpersonal Relationship Development
Importance of Interpersonal Relationships
Interpersonal Relationship Skills
Types of Interpersonal Relationships
Relevance of Interpersonal Communication in Relationship Development

Module V: Impression Management
Meaning & Components of Impression Management
Impression Management Techniques
Impression Management Training-Self help and Formal approaches

Examination Scheme:

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
Weightage (%)	20	05	20	30	25

Text & References:

Vangelist L. Anita, Mark N. Knapp, Inter Personal Communication and Human Relationships: Third Edition, Allyn and Bacon
Julia T. Wood. Interpersonal Communication everyday encounter
Beebe, Beebe and Redmond; Interpersonal Communication, 1996; Allyn and Bacon Publishers.
Rosenfeld, P., Giacalone, R.A. and Catherine, A.R. (2003). Impression Management: Building and Enhancing Reputations at Work. Thomson Learning, Singapore.

FRENCH - III

Course Code	L	T	P	Credit	Semester
FLT301	2	0	0	2	III

Course Learning Outcome:

CLO1: Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
CLO2: Students will be able to read and interpret small texts .
CLO3: Students will be able to communicate in small sentences in writing, self introduction, family description etc.

Course Contents:

Module B: pp. 76 – 88 Unité 6

Module C: pp. 89 to103 Unité 7

Contenu lexical: **Unité 6: se faire plaisir**

1. acheter: exprimer ses choix, décrire un objet (forme, dimension, poids et matières) payer
2. parler de la nourriture, deux façons d'exprimer la quantité, commander un repas au restaurant
3. parler des différentes occasions de faire la fête

Unité 7: Cultiver ses relations

1. maîtriser les actes de la communication sociale courante (Salutations, présentations, invitations, remerciements)
2. annoncer un événement, exprimer un souhait, remercier, s'excuser par écrit.
3. caractériser une personne (aspect physique et caractère)

Contenu grammatical:

1. accord des adjectifs qualificatifs
2. articles partitifs
3. Négations avec de, ne…rien/personne/plus
4. Questions avec combien, quel…
5. expressions de la quantité
6. ne…plus/toujours - encore
7. pronoms compléments directs et indirects
8. accord du participe passé (auxiliaire « avoir ») avec l'objet direct
9. Impératif avec un pronom complément direct ou indirect
10. construction avec « que » - Je crois que/ Je pense que/ Je sais que

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1

GERMAN - III

Course Code	L	T	P	Credit	Semester
FLG301	2	0	0	2	III

Course Learning Outcome:

CLO1: Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
CLO2: Students will be able to read and interpret small texts .
CLO3: Students will be able to communicate in small sentences in writing, self introduction, family description etc.
CLO4: Students will be able to communicate in small sentences in oral, self introduction, family description etc.

Course Contents:

Module I: Modal verbs
Modal verbs with conjugations and usage
Imparting the finer nuances of the language

Module II: Information about Germany (ongoing)
Information about Germany in the form of presentations or "Referat"– neighbors, states and capitals, important cities and towns and characteristic features of the same, and also a few other topics related to Germany.

Module III: Dative case
Dative case, comparison with accusative case
Dative case with the relevant articles
Introduction to 3 different kinds of sentences – nominative, accusative and dative

Module IV: Dative personal pronouns
Nominative, accusative and dative pronouns in comparison

Module V: Dative prepositions
Dative preposition with their usage both theoretical and figurative use

Module VI: Dialogues
In the Restaurant,
At the Tourist Information Office,
A telephone conversation

Module VII: Directions
Names of the directions
Asking and telling the directions with the help of a roadmap

Module VIII: Conjunctions
To assimilate the knowledge of the conjunctions learnt indirectly so far

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch

- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH – III

Course Code	L	T	P	Credit	Semester
FLS301	2	0	0	2	III

Course Learning Outcome:

CLO1: Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
CLO2: Students will be able to read and interpret small texts .
CLO3: Students will be able to communicate in small sentences in writing, self introduction, family description etc.
CLO4: Students will be able to communicate in small sentences in oral, self introduction, family description etc.

Course Contents:

Module I
Revision of earlier semester modules
Set expressions (idiomatic expressions) with the verb *Tener*, *Poner, Ir….*
Weather

Module II
Introduction to *Gustar*…and all its forms. Revision of *Gustar* and usage of it

Module III
Translation of Spanish-English; English-Spanish. Practice sentences.
How to ask for directions (using estar)
Introduction to IR + A + INFINITIVE FORM OF A VERB

Module IV
Simple conversation with help of texts and vocabulary
En el restaurante
En el instituto
En el aeropuerto

Module V
Reflexives

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras -Nivel Elemental

CHINESE – III

Course Code	L	T	P	Credit	Semester
FLC301	2	0	0	2	III

Course Learning Outcome:

CLO1: Students will hone Basic language skills such as reading, writing, speaking, listening & interactive in the language
CLO2: Students will be able to read and interpret small texts .
CLO3: Students will be able to communicate in small sentences in writing, self introduction, family description etc.

Course Contents:

Module I
Drills
Dialogue practice
Observe picture and answer the question.
Introduction of written characters.
Practice reading aloud
Practice using the language both by speaking and by taking notes.
Character writing and stroke order

Module II
Measure words
Position words e.g. inside, outside, middle, in front, behind, top, bottom, side, left, right, straight.
Directional words – beibian, xibian, nanbian, dongbian, zhongjian.
Our school and its different building locations.
What game do you like?
Difference between "hii" and "neng", "keyi".

Module III
Changing affirmative sentences to negative ones and vice versa
Human body parts.
Not feeling well words e.g.; fever, cold, stomach ache, head ache.
Use of the modal particle "le"
Making a telephone call
Use of "jiu" and "cal" (Grammar portion)
Automobiles e.g. Bus, train, boat, car, bike etc.
Traveling, by train, by airplane, by bus, on the bike, by boat.. etc.

Module IV
The ordinal number "di"
"Mei" the demonstrative pronoun e.g. mei tian, mei nian etc.
use of to enter to exit
Structural particle "de" (Compliment of degree).
Going to the Park.
Description about class schedule during a week in school.
Grammar use of "li" and "cong".
Comprehension reading followed by questions.

Module V
Persuasion-Please don't smoke.

Please speak slowly
Praise – This pictorial is very beautiful
Opposites e.g. Clean-Dirty, Little-More, Old-New, Young-Old, Easy-Difficult, Boy-Girl, Black-White, Big-Small, Slow-Fast … etc.
Talking about studies and classmates
Use of "it doesn't matter"
Enquiring about a student, description about study method.
Grammar: Negation of a sentence with a verbal predicate.

Examination Scheme:

Components	**CT1**	**CT2**	**C**	**I**	**V**	**A**
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- "Elementary Chinese Reader Part I, Part-2" Lesson 21-30

COMPUTER GRAPHICS

Course Code	L	T	P	Credit	Semester
BCI401	2	1	0	3	IV

Course Learning Outcome:

CLO1: Students will be able to use computer graphics and its different application.

CLO2: Define basic graphics workstation working mechanism.

CLO3: Demonstrate advantages and disadvantages of different drawing algorithms,
CLO4: determine and demonstrate different graphics algorithm implementations.

CLO5: Describe and apply computer graphics algorithms and design different objects using it.

Course Contents:

Module I: Introduction of Graphics
Development of Computer Graphics, Basic Graphics System and Standards.
Graphics Devices
Raster and Random Scan Devices, Continual Refresh and Storage Displays, Display Processor, Color Display Techniques, Frame Buffer, Concepts in Raster Graphics.

Module II: Graphics Primitives
Points, Pixels, Scan Conversion, Line Drawing Algorithms, Circle Drawing Algorithms, Anti-aliasing Technique, Character generator
Polygon
Polygon representation, Polygon Filling, Inside/Outside Testing

Module III: Transformation
Scaling, Translation, Rotation, Coordinate Axis Rotation, Reflection, Shears, Composite Transformation, Modeling and Coordinate Transformation
Viewing
Two – Dimensional Viewing, Viewing transformation, Interactive Picture Construction Techniques, Interactive Input / Output Devices,

Module IV: Segment
Segment Table, Creating Deleting and Renaming a Segment, Visibility and Image Transformation
Windowing and Clipping
Window, View-port, Line clipping, polygon clipping, Multiple Windowing

Module V: Three Dimensional Concepts
3-D Representation and Transformation, 3-D Viewing, Algorithm for 3-D Volumes, Introduction to Spline Curves and Surfaces

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Computer Graphics By Donald Hearn And Pauline Baker
- Harrington's "Computer Graphics " A Programming Approach
- Principle Of Interactive Computer Graphics by New, W. M. and Spraull

- Foley "Computer Graphics" Addission Wesley
- Rogers' "Procedural Elements of Computer Graphics " Mc-Grawhilll

DESIGN & ANALYSIS OF ALGORITHMS

Course Code	L	T	P	Credit	Semester
BCI402	2	1	0	3	IV

Course Learning Outcome:

CLO1: Define the algorithms time and space complexity and analyze the algorithm.

·CLO2: Describe the divide and conquer strategy and its application.

·CLO3: Apply algorithms and design techniques to solve problems.

·CLO4: Compare different algorithms and find out the best solution according to constraints.

·CLO5: Evaluate the problems in different domains.

Course Contents:

Module I: Introduction

Algorithms, Analyzing algorithms, Designing algorithms.
Mathematical Foundations: Growth of Functions-Asymptotic notation, Recurrence
The substitution Method, Recursion tree method, Master Method.

Module II: Sorting and Order statistics

Divide & Conquer Strategy, Heap Sort, Quick Sort, Matrix Multiplication, Sorting in Linear time.
Data Structures: Elementary data structures, hash tables, Binary search trees.

Module III: Advanced Design and Analysis Techniques
Dynamic programming- Elements of dynamic programming, Chain-matrix multiplication, All pair shortest path (Flayed -algorithm), Optimal Binary Search, Tree.
Greedy algorithms - Elements of the greedy strategy, Huffman codes, Single-source shortest path in a directed graph, Knapsack problem, Minimum Spamming trees- The Algorithm of Kruskals and Prims.

Module IV: Graph Algorithms

Elementary graphs Algorithms, Minimum spanning Trees, Single source Shortest paths, All Pair Shortest Paths.
Selected Topics: Sorting Networks, Algorithms for Parallel Computers.

Module V
Polynomials and tile FFT, String Matching, NP-Completeness, Approximation Algorithms.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:
- Coreman, Rivest, Lisserson, "Algorithms", PHI
- Horowitz & Sahni," Fundamental of Computer Algorithm", Galgotia. Aho, Hopcropt,

Ullman,
- Data Structure & Algoritlull", Addision Wesley.

OPERATING SYSTEMS

Course Code	L	T	P	Credit	Semester
BCI403	2	1	0	3	IV

Course Objective:

CLO1: Describe the important computer system resources and the role of operating system in their management policies and algorithms

CLO2: Understand the process management policies and scheduling of processes by CPU

CLO3: Describe and analyse the memory management and its

allocation policies.

Course Contents:

Module I: Operating System as a Resource Manager
Operating System Classifications
Monitor, Multiprogramming, Time Sharing, Real Time Systems,
Multiprocessor Systems and Operating System Services.

Module II: CPU Scheduling
Basic Scheduling Concepts, Process Overviews, Process States, Multiprogramming,
Scheduler and Scheduling Algorithms, Multiple Processor Scheduling

Module III: Memory Management
Bare Machine, Resident Monitor, Partition, Paging and Segmentation, Virtual Memory and Demand Paging, Replacement Policies, Cache Memory

Module IV: File Systems
File Support, Access Methods
Allocation Methods- Contiguous Linked and Index Allocation
Directory Systems
Single Level, Tree Structured, Acyclic Graph and General Graph Directory, File Protection
Deadlock
Deadlock Characterization, Deadlock Prevention, Deadlock Avoidance and Deadlock Recovery

Module V: Security and Protection
Security Policies and Mechanism
Protection and Access Control-Access Matrix Model of Protection, Access Hierarchies, Access List, Capabilities
Overview of Unix Operating System

Command-Language User's View of Unix, Implementation of Unix, Unix Summary Etc.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Peterson And Silberschatz, Operating System Concepts
- Tannenbaum A.S., Modern Operating System
- Crowly Charrles, Operating System- A design Approach
- Dietel H.M., Operating Systems

MULTIMEDIA TECHNOLOGIES

Course Code	L	T	P	Credit	Semester
BSI404	2	1	0	3	IV

Course Learning Outcome:

CLO1: To learn the basics of multimedia technologies and protocols and technical aspect of Multimedia Systems.

CLO 2: To understand various networking aspects used for multimedia applications.

CLO 3: To understand the protocols and standards available for different audio, video, and text applications and their compression technologies.

CLO 4: To understand the multimedia data types and the life cycle of multimedia software development.

Module I – Introduction to Multimedia

What is multimedia?, communication and information transfer model, human computer communication, components of multimedia, multimedia building blocks, scope of multimedia, uses of multimedia.

Module 2 – Interaction Technology and Devices

Human computer interface, input technologies, Output Technologies, combined input-out devices, storage technology, communication and networking technologies, processing technologies.

Module 3 – Compression Technologies for Multimedia

Need for data compression, compression basics, lossless compression, lossy compression techniques.

Module 4 – Multimedia Types

Digital text, font, character code, hypertext, hypermedia, uses and applications, images, graphics, digital audio, video, and animation, making the web page interactive with multimedia contents.

Module 5 – Designing Multimedia

Development teams, analysis phase, design phase, development phase, implementation phase, evaluation and testing phase.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Multimedia Technologies by Ashok Banerji and Ananda Mohan Ghosh, Tata McGraw Hill, ISBN:978-0-07-066923-9, 2010.
- Multimedia Applications by Ralf Steinmetz, Klara Nahrstedt, Springer Science & Business Media, 2004.
- Multimedia: Computing, Communications and Applications by Ralf Steinmetz, Klara Nahrstedt, Pearson Education, 2009

COMPUTER GRAPHICS LAB

Course Code	L	T	P	Credit	Semester
BCI421	0	0	2	1	IV

Course Learning Outcome:

CLO1. Read and understand Computer graphics code of medium-to-high complexity.

CLO2. Use standard and different type of Graphics libraries when required for implementation.

CLO3. Understand the basic principles of creating Computer Graphics applications or program.

CLO4. Understand the fundamental concepts of computer graphics implementation.

LIST OF PRACTICALS

(1) Create a project that allows the user to input information and then display the lines of output for a mailing label. Fields to be input by the user requires text boxes where information to be displayed belongs in label. Use text boxes for 1st name, last name, street no., city, state, zip code. Provide tool tips, use command buttons for display, clear, print and exit. Make the display button as default button and clear as cancel button.

(2) Design and code a project that has shipping information. Use text boxes with labels attached for catalog code, page no., part no.. Use two group of option button on the form enclosed each group in the frame. The 1st frame should have caption of shipping and contain button for express and ground. For 2nd frame use a caption of payment type and include buttons for check, money order or credit card. Use a check box for new customer. Add command buttons for print, clear and exit. Make the clear button the cancel button and add tool tips.

(3) Create a project for book sales. Make text boxes for quantity, title and price with labels. Calculate total price, discount (15%) and discounted price. Make command buttons for calculate, clear and exit.

(4) Create a project for the local car rental agency that calculates rental charges. The agency charge $15 per day + $0.50 per km. use text boxes for customer name, address, city, state, zip code, beginning and ending audiometer reading and no. of days the car was used. Use labels to display the miles given and the total charges. Make command buttons for clear, exit and calculate.

(5) Create a project that will input an employee salary. Calculate a gross salary, deduction and net salary. Each employee will receive a basic pay of $900 + sales commission of 6% of sales. After calculating the net paid calculate the budget amount of each category based on the % given.

Bank pays	$900
Commission	6% of sales
Gross pay	Basic pay + Commission
Deduction	18% of gross pay
Net pay	Gross pay - deduction

Budeget :-

Housing	30% of net pay
Food and clothing	15% of net pay
Entertainment	50% of net pay
Miscellaneous	5% of net pay

Use text boxes to input the employee name, amount of sales. Use labels to display the result and the calculation. Use calculates, clear and exit command buttons.

(6) Maintain a list of types of ice creams. Use a drop down combo box to hold the ice-cream type and use command button to add, remove, clear, display and exit. Don't allow a blank type to be added to the list. Display an error message if the user select remove without first selecting an ice-cream type. Before clearing the list, display a message to confirm the operation.

(7) Create a project that contains a form for entering book information from controls.

- Text boxes for author and title.
- Option button for type fiction or non-fiction.
- Dropdown list for subject that will include bestseller, fantasy, religion, romance, humor, science fiction, business, philosophy, education, self-help and mystery.
- List box for shelf no. containing RC-111, RC-112, RC-113, and RC-114.
- Use command buttons display, clear and exit.
- Use labels to display information.

(8) Create a list box, which contains names of all cinema halls of NCR. If you choose name of cinema hall, label display information regarding all movies running in the cinema halls.

(9) Create a project that contains student's information

- Text boxes to display name and courses.
- Option buttons for semester/ year.
- Use list boxes for computers, business, humanities, Commerce, medical and engineering.
- A simple combo for name of college.
- Display information on a label.
- Make command buttons for display, clear and exit.

(10) Write a program, using recursive function to calculate Factorial of any no., also display the factorial of all no. smaller than that in a list box.

(11) Write a program, using recursive function to calculate Nth Fibonacci number.

(12) Write a program, using recursive function to generate Fibonacci Series.

(13) Write a program, using recursive function to calculate Power of a number.

(14) Write a program, using recursive function to calculate GCD of a number.

(15) Write a program, using recursive function for Tower of Hanoi, showing all the steps in a list box.

(16) Write a program to division of two numbers. Also shows divide by zero error.

(17) Write a program, to check whether a given number is prime number or not.

(18) Write a program to generate first 10 prime numbers.

(19) Write a program, to check whether a given string is palindrome or not.

(20) Write a program to enter elements of an array in list box and update them by incrementing or decrementing them by 10 and store the results in other list.

(21) Write a program to search an element in an array, using Linear Search.

(22) Write a program to search an element in an array, using Binary Search.

(23) Write a program to add all the numbers entered by user using input box and the program should terminate as soon as the user enters zero.

(24) Write a program to prepare a login form with restricted features.

(25) Write a program to increase and decrease the size of text and shape by using horizontal and vertical bar.

(26) Write a program to design a calculator by using control array.

(27) Write a program to design a watch by using timer control.

(28) Write a program to display the selected path of particular file in Text Box using File, Directory and Drive list box.

(29) Design a active menu Bar, standard toolbar and status Bar

(30) Write a program to find out the no. of character, words and blank spaces in the given string.
(31) Write a program to concatenate two strings.
(32) Write a program to check whether the given string is in upper case or lower case and also convert it's case.
(33) Write a program to calculate the sum of the digits of a given no. and also reverse the no.

(34) Write a program to create a Pop Up Menu.

(35) Design a project that has multiple forms, such that form1 is welcome form, form2 Contains personal details and from3 contains professional information and form4 display both personal as well as professional information of a employee.
(36) Design a project for a MDI application, such that child1 contains no menu and child2 contains menu. With this demonstrate working of an MDI form.
(37) Create a project that maintains a Publisher table in a Library database, having fields' pub id, name, company name, address, city, telephone. Allow Adds and Deletes to the database. Include command buttons for navigation.
(38) Create a project that maintains a Publisher table in a Library database, having fields pub id, name, company name, address, city, telephone. Allow Adds and Deletes to the database. Add data control for navigation. Include Add and Delete command buttons in form for adding and deleting records.
(39) Create a project that maintains a Book table in Library database, having fields title, author, ISBN, publisher, subject and price. Use ADO Data Environment to display information on form. Use command buttons for navigation.
(40) Create a project that maintains a Subject table in Library database, having fields Subject code and subject name. Use ADODC for navigation and command buttons Add and Delete, for adding and deleting records.
(41) Create a project that maintains a Vehicle table in Auto database, having fields Inventory id, manufacturer, model name, year, vehicle id and cost. With programming form ADO connection, include command buttons for navigation. Also include Add and Delete command buttons for adding and deleting records.

Examination Scheme:

IA				**EE**	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

DOMAIN ELECTIVE
INTRODUCTION TO .NET TECHNOLOGIES

Course Code	L	T	P	Credit	Semester
BCI431	2	1	0	3	IV

Course Learning Outcome:

CLO1:Understand the .Net Technology.
CLO2: Learn design, code generation, testing and debugging including use of the ASP.NET (Active Server Pages) the SQL Server database.
CLO3: Understand the concept of SQL Server database and connection with ASP.

Course Contents:

Module I: Introduction to .NET technologies

Features of .NET, .NET Framework, CLR framework, MSIL, .NET class library, .NET Languages, CTS, assemblies, manifest, and metadata, What is ASP.NET?, Difference between ASP and ASP.NET.

Module II: Introduction to C#, Variables and expressions, flow controls, functions, debugging and error handling, OOPs with C#, Defining classes and class members, collections, Type Casting, String functions, Indexers, Delegates and events.

Module III: Controls in ASP.NET

Overview of Dynamic Web page, Understanding ASP.NET Controls, Applications, Web servers, Installation of IIS. Web forms, web form controls -server controls, client controls. Adding controls to a web form, Buttons, Text Box, Labels, Checkbox, Radio Buttons, List Box. Adding controls at runtime. Running a web Application, creating a multiform web project. Form Validation: Client side validation, server Side validation, validation Controls: Required Field Comparison Range. Calendar control, Ad rotator Control, Internet Explorer Control, Dynamic Controls.

Module IV: Overview of ADO.NET and XML

What is ADO.NET, from ADO to ADO.NET? ADO.NET architecture, Accessing Data using Data Adapters and Datasets , using Command & Data Reader, binding data to data bind Controls, displaying data in data grid, XML basics, attributes, fundamental XML classes: Document, text writer, text reader. XML validations, XML in ADO.NET, The XML Data Document.

Module V: ASP.NET Applications and Web services

Creating, tracking, caching, error handling, Securing ASP.NET applications- form based applications, window based application. Introduction, State management- View state,

Session state, Application state, Building ASP.NET web services, working with ASP.NET applications, creating custom controls.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

Text:

- ASP.NET Unleashed by Stephen Walther, SAMS publications

References:

- ASP.NET, Wrox Publications
- ASP.NET and VB.NET, Wrox Publication
- ASP.NET and C#.NET, Wrox publication.

INTRODUCTION TO OPEN SOURCE TECHNOLOGIES (PHP, MySql)

Course Code	L	T	P	Credit	Semester
BCI432	2	1	0	3	IV

Course Learning Outcome:

CLO1:Learn how to create an interactive website, allowing visitors to post and retrieve information provided by you or your site's visitors. In this online course, you'll see how to create dynamic web pages using the PHP programming language and the MySQL database server.

CLO2: During the course, you'll walk through the development of a complete content management system web application. You'll receive clear, step-by-step, instructions demonstrating how to create a complete website capable of dynamically displaying data from a MySQL database.

CLO3: You'll discover how you can allow your site's visitors to add new information to an online database, search through posted data, and create meaningful printed reports. By the end of this course, you'll have plenty of useful code templates that will help you create your very own dynamic, web-based, content management system.

Course Contents:

Module I: Introduction to PHP programming
Introduction to PHP, installation and configuration, Variables, String functions, Numeric functions

Module II: Operator, Loops and Array
Operators, Conditions, Loops, Array, Multidimensional Array, Associative array

Module III: Classes and Functions
Classes, Regular Expr, Working with Datetime, code re-use, require (), include(), and the include_path; filesystem functions, and file input and output; file uploads; error handling and logging; sending mail,

Module IV: Working with database
MYSQL, Introducing MySQL; database design concepts; the Structured Query, Language (SQL); communicating with a MySQL backend via the PHP, MySQL APIBuilding Database Applications,

Module V: Working with Frameworks
Working with Wordpress, Mambo, Joomla, OS Commerce, Zend Framework, Drupal

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Beginning PHP, Apache, MySQL Web Development
- Michael K. Glass, Yann Le Scouarnec, Elizabeth Naramore, Gary Mailer, Jeremy Stolz, Jason Gerner
- PHP Manual.

INTRODUCTION ROUTING AND SWITCHING IN THE ENTERPRISE

Course Code	L	T	P	Credit	Semester
BCI433	2	1	0	3	IV

Course Objective:

CLO1:This course familiarizes students with the equipment applications and protocols installed in enterprise networks, with a focus on switched networks, IP Telephony requirements, and security. It also introduces advanced routing protocols such as Enhanced Interior
CLO2: Gateway Routing Protocol (EIGRP) and Open Shortest Path First (OSPF) Protocol. Hands-on exercises include configuration, installation, and troubleshooting.
CLO3: Understand the concepts of protocols.

Course Contents:

Module I: Networking in the Enterprise
Describing the Enterprise Network, Identifying Enterprise Applications

Module II: Exploring the Enterprise Network Infrastructure
Describing Current Network, Supporting Enterprise Edge, Reviewing Cisco Routing & Switching

Module III: Switching in an Enterprise Network
Describing Enterprise Level Switching, Preventing Switching Loops, Configuring VLANs, Trunking and Inter-VLAN Routing, Maintaining VLANs on an Enterprise Network

Module IV: Addressing in an Enterprise Network
Using a Hierarchical IP Network Address Scheme, Using VLSM, Using Classless Routing and CIDR, Using NAT and PAT

Module V: Routing with a Distance Vector Protocol
Managing Enterprise Networks, Routing Using the RIP Protocol, Routing Using the EIGRP Protocol, Implementing EIGRP

Module VI: Routing with a Link-State Protocol
Routing Using OSPF Protocol, Implementing Single-Area OSPF, Using Multiple Routing Protocols

Module VII: Implementing Enterprise WAN Links
Connecting the Enterprise WAN, Comparing Common WAN Encapsulations, Using Frame Relay

Module VIII: Filtering Traffic Using Access Control Lists
Using Access Control Lists, Using a Wildcard Mask, Configuring Access Control Lists, Permitting & Denying Specific Types of Traffic, Filtering Traffic Using Access Control Lists

Module IX: Troubleshooting an Enterprise Network

Understanding the Impact of Network Failure, Troubleshooting Switching and Connectivity Issues, Troubleshooting Routing Issues, Troubleshooting WAN Configurations, Troubleshooting Access Control List Issues

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- CCNA-Discovery 4.0, module 3, Cisco Certified Networking Academy
- Data Communication and Computer Network, Forozoun, TMH Publication
- Data Communication and Network, Stallings, PHI
- Computer Network, Tanenbaum, PHI

INTRODUCTION TO .NET TECHNOLOGIES LAB

Course Code	L	T	P	Credit	Semester
BCI441	0	0	2	1	IV

Course Learning Outcome:

CLO1:Understand the .Net Technology.
CLO2: Learn design, code generation, testing and debugging including use of the ASP.NET (Active Server Pages) the SQL Server database.
CLO3: Understand the concept of SQL Server database and connection with ASP.

Course Contents:

1. Write a console application that obtains four int values from the user and displays the product.
2. If you have two integers stored in variables var1 and var2, what Boolean test can you perform to see if one or the other (but not both) is greater than 10?
3. Write an application that includes the logic from Exercise 1, obtains two numbers from the user, and displays them, but rejects any input where both numbers are greater than 10 and asks for two new numbers.
4. Write a console application that places double quotation marks around each word in a string.
5. Write an application that uses two command-line arguments to place values into a string and an integer variable, respectively. Then display these values.
6. Write an application that receives the following information from a set of students: Student Id: Student Name: Course Name: Date of Birth: The application should also display the information of all the students once the data is entered. Implement this using an Array of Structures.
7. Write programs using conditional statements and loops:
   - Generate prime numbers.
   - Generate various patterns (triangles, diamond and other patterns) with numbers.
8. Write a program to declare a class ‘staff’ having data members as name and post. Accept this data 5for 5 staffs and display names of staff who are HOD.
9. Write a program to declare class ‘Distance’ have data members dist1, dist2, dist3. Initialize the two data members using constructor and store their addition in third data member using function and display addition.
10. Write a program using function overloading to swap two integer numbers and swap two float numbers.
11. Write a program to implement single inheritance.
12. Define a class ‘salary’ which will contain member variable Basic, TA, DA, HRA. Write a program using Constructor with default values for DA and HRA and calculate the salary of employee.
13. Write a program for above class hierarchy for the Employee where the base class is Employee and derived class and Programmer and Manager. Here make display function virtual which is common for all and which will display information of Programmer and Manager interactively.
14. Write a program to accept a number from the user and throw an exception if the number is not an even number.
15. Create an application that allows the user to enter a number in the textbox named ‘getnum’. Check whether the number in the textbox ‘getnum’ is palindrome or not. Print the message accordingly in the label control named lbldisplay when the user clicks on the button ‘check’.
16. Create an application which will ask the user to input his name and a message, display the two items concatenated in a label, and change the format of the label using radio buttons and check boxes for selection , the user can make the label text bold ,underlined or italic and change its color . include buttons to display the message in the label, clear the text boxes and label and exit.
17. Create a project that calculates the total of fat, carbohydrate and protein. Allow the user to enter into text boxes. The grams of fat, grams of carbohydrate and grams of protein. Each gram of fat is 9 calories and protein or carbohydrate is 4 calories. Display the total calories of the current food item in a label. Use to other labels to display and accumulated some of calories and

the count of items entered. The form food have 3 text boxes for the user to enter the grams for each category include label next to each text box indicating what the user is entering.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

INTRODUCTION TO OPEN SOURCE TECHNOLOGIES (PHP, MySql) LAB

Course Code	L	T	P	Credit	Semester
BCI442	0	0	2	1	IV

Course Learning Outcome:

CLO1:Learn how to create an interactive website, allowing visitors to post and retrieve information provided by you or your site's visitors. In this online course, you'll see how to create dynamic web pages using the PHP programming language and the MySQL database server.

CLO2: During the course, you'll walk through the development of a complete content management system web application. You'll receive clear, step-by-step, instructions demonstrating how to create a complete website capable of dynamically displaying data from a MySQL database.

CLO3: You'll discover how you can allow your site's visitors to add new information to an online database, search through posted data, and create meaningful printed reports. By the end of this course, you'll have plenty of useful code templates that will help you create your very own dynamic, web-based, content management system.

Course Contents:

1. Write the process of installation of web server.
2. Write programs to print all details of your php sever. Use phpinfo().
3. Write a program to give demo of ECHO and PRINT command.
4. Write a program sort ten number by using array.
5. Create a database in MySql and connect that database from PHP.
6. Write a program to Update, insert and delete the values of table in Question No – 9 database.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

INTRODUCTION ROUTING AND SWITCHING IN THE ENTERPRISE LAB

Course Code	L	T	P	Credit
BCI443	0	0	2	1

Course Objective:

CLO1:This course familiarizes students with the equipment applications and protocols installed in enterprise networks, with a focus on switched networks, IP Telephony requirements, and security. It also introduces advanced routing protocols such as Enhanced Interior
CLO2: Gateway Routing Protocol (EIGRP) and Open Shortest Path First (OSPF) Protocol. Hands-on exercises include configuration, installation, and troubleshooting.
CLO3: Understand the concepts of protocols.

LIST OF PRACTICALS

1. Application of Cisco Router and Switches in Enterprise Network with example design.
2. Enterprise level Switching techniques.
3. Creating LAN with swich and preventing loops with example.
4. Creating ,Managing and deleting different VLAN.
5. Creating Trunking and Intr-VLAN Routing.
6. Use of VLSM and CIDR for Hierarchical IP Network Address Scheme with some example scenario.
7. Configuration of NAT and PAT in router.
8. Configuring router with RIP Protocol.
9. Configuring router with EIGRP Protocol.
10. Configuration of ACL in router and use of Wildcard Mask.
11. Configuring router as gateway for traffic filtering with example scenario.

12. Troubleshooting Switching, Routing, WAN and ACL issues.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

MINOR PROJECT

Course Code	L	T	P	Credit	Semester
BSI450	0	0	0	6	IV

Course Learning Outcome:

CO1. Identify the proposed problem

CO2. Develop a functional application based on the software design

CO3. Apply to code, debugging, and testing tools for implementation

CO4. Prepare the proper documentation for report writing and oral presentation.

GUIDELINES FOR PROJECT FILE

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation.

Research is genuine exploration of the unknown that leads to new knowledge, which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.
The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals.
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

Report Layout
The report should contain the following components

1. File should be in the following specification

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components
Front Page
Table of Contents
Acknowledgement
Student Certificate
Company Profile
Introduction
Chapters
Appendices
References / Bibliography

- **Title or Cover Page or Front Page**

The title page should contain the following information: Project Title; Student's Name; Course; Year; Supervisor's Name.

- **Table of Contents**

Titles and subtitles are to correspond exactly with those in the text.

- **Acknowledgement**

Acknowledgment to any advisory or financial assistance received in the course of work may be given.

- **Student Certificate**

Given by the Institute.

- **Company Certificate & Profile**

This is a certificate, which the company gives to the students. A Company Profile corresponds to a file with company-specific data. Company data can be stored there and included in a booking when needed.

- **Introduction**

Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

- **Chapters**

All chapters and sections must be appropriately numbered, titled and should neither be too long nor too short in length.

The first chapter should be introductory in nature and should outline the background of the project, the problem being solved, the importance, other related works and literature survey. The other chapters would form the body of the report. The last chapter should be concluding in nature and should also discuss the future prospect of the project.

- **Appendices**

The Appendix contains material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

- **References / Bibliography**

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project. Project execution is concerned with assessing how much work has been put in.
The File should fulfill the following ***assessment objectives:***

1. Writing a critical literature review
    - Search for literature
    - Summarizing and presenting the literature
    - Evaluating key content and theories
2. Collecting and analyzing research material
    - Choosing and designing research method
    - Conducting the research
    - Analyzing, sorting and classifying the data to make decision
3. Interpreting research method and draw conclusion
    - Findings
    - Recommendation
4. Assigning the theories and writing the project report
    - Structuring the project in accordance with the given style
5. Bibliography
    - This refer to the books, Journals and other documents consulting while working on the project

Examination Scheme:

Components	**MRP**	**V**	**S**	**FP**	**R**
Weightage (%)	20	20	20	20	20

MRP – Mid Report Presentation, V – Viva, S – Synopsis, FP – Final Presentation, R - Report

Anandam

Course Code	L	T	P	Credit	Semester
AND004	2	0	0	2	IV

Course Learning Outcome:

CLO1: Awareness and empathy regarding community issues
CLO2: Interaction with the community and impact on society
CLO3: Interaction with mentor and development of Student teacher relationship
CLO4: Interaction among students, enlarge social network
CLO5: Cooperative and Communication skills and leadership qualities Critical thinking, Confidence and Efficiency

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants, phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.
- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.
3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.
6. For the topic chosen by the group, students are recommended to cover the following points:
    a) Current scenario (Regional, national and international level as applicable)
    b) Future predictions

c) Duty of the government
d) Government policies (related to the topic), if any
e) Duty of public
f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
3. Conclusion is clearly stated. The underlying logic is explicit.

COMMUNICATION SKILLS - II

Course Code	L	T	P	Credit	Semester
BCS401	1	0	0	1	I

A. COURSE LEARNING OUTCOMES (CLO)

CLO 1	Identify steps to professional communication
CLO 2	Identify the key components of meeting, agendas and meeting minutes
CLO 3	Understand the key skills and behaviors required to facilitate a group discussion/presentation
CLO 4	Polish current affairs & rapport building

B. SYLLABUS

Topic
Enhancing Speaking Skills (Public Speaking)
Resume Building-1
GD-2 (Specifically: Social & Political)
Presentations-2

EXAMINATION SCHEME:

Components	Public Speaking	GD	Poster Presentation	Attendance
Weightage (%)	30	30	35	5

SUGGESTED READINGS

- Essential Telephoning in English, Garside/Garside, Cambridge
- Working in English, Jones, Cambridge
- Dr. P.Prasad. *Communication Skills*.S.K.Kataria &Sons
- Koneru, Aruna. *Professional Communication.* The McGraw Hill: New Delhi, 2008. Print
- Krishnaswamy N, *Creative English for Communication***.** Delh**i:** Macmillan Publishers India Ltd. Print. 2007.

BEHAVIOURAL SCIENCE - IV
(GROUP DYNAMICS AND TEAM BUILDING)

Course Code	L	T	P	Credit	Semester
BSS403	1	0	0	1	IV

Course Learning Outcome:

1. Compare the difference between the groups and teams and their strength and weaknesses. Also, the internal and external factors that affect their functioning.
2. Access when there is a need of group formation and when it is needed to be transformed into team.
3. Identify the characteristics of leaders and the power practiced by them.
4. Apply the type of leadership style power practiced in different situation

Course Contents:

Module I: Group formation
Definition and Characteristics
Importance of groups
Classification of groups
Stages of group formation
Benefits of group formation

Module II: Group Functions
External Conditions affecting group functioning: Authority, Structure, Org. Resources, Organizational policies etc.
Internal conditions affecting group functioning: Roles, Norms, Conformity, Status, Cohesiveness, Size, Inter group conflict.
Group Cohesiveness and Group Conflict
Adjustment in Groups

Module III: Teams
Meaning and nature of teams
External and Internal factors effecting team
Building Effective Teams
Consensus Building
Collaboration

Module IV: Leadership
Meaning, Nature and Functions
Self leadership
Leadership styles in organization
Leadership in Teams

Module V: Power to empower: Individual and Teams
Meaning and Nature
Types of power
Relevance in organization and Society

Examination Scheme:

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
Weightage (%)	20	05	20	30	25

Text & References:

- Organizational Behaviour, Davis, K.
- Hoover, Judhith D. Effective Small Group and Team Communication, 2002,Harcourt College Publishers
- Dick, Mc Cann & Margerison, Charles: Team Management, 1992 Edition, viva books
- LaFasto and Larson: When Teams Work Best, 2001, Response Books (Sage), New Delhi
- Smither Robert D.; The Psychology of Work and Human Performance, 1994, Harper Collins College Publishers

FRENCH – IV

Course Code	L	T	P	Credit	Semester
FLT401	2	0	0	2	IV

Course Learning Outcome:

CLO1: Students will hone intermediate language skills such as reading, writing, speaking, listening & interactive) in the language
CLO2: Students will be able to read and interpret small texts of intermediate level.
CLO3: Students will be able to communicate in small sentences in Simple Future and Past tenses .
CLO4: Students will be able to communicate in oral in small sentences in Simple Future and Past tenses. etc.

Course Contents:

Module C: pp. 104 – 139: Unités 8, 9

Contenu lexical: Unité 8: Découvrir le passé

1. parler du passé, des habitudes et des changements.
2. parler de la famille, raconter une suite d'événements/préciser leur date et leur durée.
3. connaître quelques moments de l'histoire

Unité 9: Entreprendre

1. faire un projet de la réalisation: (exprimer un besoin, préciser les étapes d'une réalisation)
2. parler d'une entreprise
3. parler du futur

Contenu grammatical:

1. Imparfait
2. Pronom « en »
3. Futur
4. Discours rapporté au présent
5. Passé récent
6. Présent progressif

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1

GERMAN - IV

Course Code	L	T	P	Credit	Semester
FLG401	2	0	0	2	IV

Course Learning Outcome:

CLO1: Students will hone intermediate language skills such as reading, writing, speaking, listening & interactive) in the language
CLO2:Students will be able to read and interpret small texts of intermediate level.
CLO3: Students will be able to communicate in small sentences in Simple Future and Past tenses .
CLO4:Students will be able to communicate in oral in small sentences in Simple Future and Past tenses. etc.

Course Contents:

Module I: Present perfect tense

Present perfect tense, usage and applicability
Usage of this tense to indicate near past
Universal applicability of this tense in German

Module II: Letter writing

To acquaint the students with the form of writing informal letters.

Module III: Interchanging prepositions

Usage of prepositions with both accusative and dative cases
Usage of verbs fixed with prepositions
Emphasizing on the action and position factor

Module IV: Past tense

Introduction to simple past tense
Learning the verb forms in past tense
Making a list of all verbs in the past tense and the participle forms

Module V: Reading a Fairy Tale

Comprehension and narration

- Rotkäppchen
- Froschprinzessin
- Die Fremdsprache

Module VI: Genitive case

Genitive case – Explain the concept of possession in genitive
Mentioning the structure of weak nouns

Module VII: Genitive prepositions

Discuss the genitive propositions and their usage: (während, wegen, statt, trotz)

Module VIII: Picture Description

Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3

- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH - IV

Course Code	L	T	P	Credit	Semester
FLS401	2	0	0	2	IV

Course Learning Outcome:

CLO1: Students will hone intermediate language skills such as reading, writing, speaking, listening & interactive) in the language
CLO2:Students will be able to read and interpret small texts of intermediate level.
CLO3: Students will be able to communicate in small sentences in Simple Future and Past tenses .
CLO4:Students will be able to communicate in oral in small sentences in Simple Future and Past tenses. etc.

Course Contents:

Module I
Revision of earlier semester modules
Introduction to Present Continuous Tense (Gerunds)

Module II
Translation with Present Continuous Tense
Introduction to Gustar, Parecer, Apetecer, doler

Module III
Imperatives (positive and negative commands of regular verbs)

Module IV
Commercial/business vocabulary

Module V
Simple conversation with help of texts and vocabulary
En la recepcion del hotel
En el restaurante
En la agencia de viajes
En la tienda/supermercado

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español Sin Fronteras (Nivel – Elemental)

CHINESE – IV

Course Code	L	T	P	Credit	Semester
FLC401	2	0	0	2	IV

Course Learning Outcome:

CLO1: Students will hone intermediate language skills such as reading, writing, speaking, listening & interactive) in the language
CLO2:Students will be able to read and interpret small texts of intermediate level.
CLO3: Students will be able to communicate in small sentences in Simple Future and Past tenses .
CLO4:Students will be able to communicate in oral in small sentences in Simple Future and Past tenses. etc.

Course Contents:

Module I

Dialogue Practice
Observe picture and answer the question
Pronunciation and intonation
Character writing and stroke order.
Electronic items

Module II

Traveling – The Scenery is very beautiful
Weather and climate
Grammar question with – "bu shi …. Ma?"
The construction "yao … le" (Used to indicate that an action is going to take place)
Time words "yiqian", "yiwai" (Before and after).
The adverb "geng".

Module III

Going to a friend house for a visit meeting his family and talking about their customs.
Fallen sick and going to the Doctor, the doctor examines, takes temperature and writes prescription.
Aspect particle "guo" shows that an action has happened some time in the past.
Progressive aspect of an actin "zhengzai" Also the use if "zhe" with it.
To welcome someone and to see off someone …. I cant go the airport to see you off… etc.

Module IV

Shipment. Is this the place to checking luggage?
Basic dialogue on – Where do u work?
Basic dialogue on – This is my address
Basic dialogue on – I understand Chinese
Basic dialogue on – What job do u do?
Basic dialogue on – What time is it now?

Module V

Basic dialogue on – What day (date) is it today?
Basic dialogue on – What is the weather like here.
Basic dialogue on – Do u like Chinese food?
Basic dialogue on – I am planning to go to China.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

SOFTWARE ENGINEERING

Course Code	L	T	P	Credit	Semester
BSI501	2	1	0	3	V

Course Learning Outcome:

CLO1: Design a software development strategy and select appropriate software development for any given software project

CLO 2: Design requirements, analysis and design diagrams from requirements to deployment of any given software.

CLO 3: Understand ethical obligations while developing a software for a client organization

CLO 4: Keeps updated with new trends in software development methodologies

Course Contents:

Module I: Software Development Life Cycle
Evolution of Software Engineering, Software Problems, Issues Involved in Software Engineering, Fundamental Qualities of a Software Product, Approaches to Software Engineering, Planning the development Process, Development/Product Life-Cycle Model, Kinds of Software Life-Cycle Model.

Module II: Project Management
Project Management Concepts, Project Management Activities, Size Metrics.
Software Requirement analysis and Specification, Cost Models.

Module III: System Design
Design Objectives, Design Principles, Effective Modular Design (Functional Independence, Coupling, and Cohesion), Design Tools and Techniques, Prototyping, Structured Programming.

Module IV: Coding
Programming Practices, Verification, Monitoring and Control.

Module V: Software Testing
Testing Fundamentals, Test case design, Functional Testing, Structural Testing, Test Plan, Activities during testing, Unit System, Integration Testing, Software Maintenance.

Module VI: Software Reliability
Concept of Software Reliability, Software Repair and Availability, Software Errors, Failure and Faults.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Software Engineering, A Practitioner's Approach - Roger S. Pressman.
- An Integrated Approach to Software Engineering, Pankaj Jalote.
- Software Engineering Concepts, Richard Fairley.

JAVA PROGRAMMING

Course Code	L	T	P	Credit	Semester
BCI502	2	1	0	3	V

Course Objective:

CLO1: Read and understand Java-based software code of medium-to-high complexity. Use standard and third party Java's API's when writing applications.

CLO2: Understand the basic principles of creating Java applications with graphical user interface (GUI).

CLO3: Understand the fundamental concepts of computer science: structure of the computational process, algorithms and complexity of computation.

CLO4: Understand the basic approaches to the design of software applications.

CLO5:Apply the above to design, implement, appropriately document and test a Java application of medium complexity, consisting of multiple classes.

Course Contents:

Module I: Introduction
Concepts of OOP, Features of Java, How Java is different from C++, Data types, Control Statements, identifiers, arrays, operators. Variables, Applications and Applets

Module II: Java Programming
Classes and methods, Constructor, Types of constructor, method overloading
Inheritance: Single Inheritance, Multilevel hierarchy, method overriding, Abstract classes, Interface, Final classes, Garbage Collection, String classess

Module III: AWT and Event Handling
Introduction to AWT, Layout Manager, Event handling Mechanism, Event Model, Event Classes, Sources of Events, Event Listener Interfaces
AWT: Working with Windows, AWT Controls
Html basic tags, Applet Classes, Graphics,

Module IV: Exception Handling and Multithreading
Exception handling, fundamentals exception types, uncaught exceptions, throws, throw, try and catch, final, built in exception, creating your own exception
Multithreading fundaments, Creating, Implementing and Extending thread, thread priorities, synchronization suspending, resuming and stopping Threads

Module V: Java Packages

Package creation, Additional Packages, Input Output Exploring java.io, Swing classes and controls, Advantages of Swing over AWT.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Naughton, Schidt "The Complete Reference JAVA 2 " TMH
- Balaguruswamy "Programming in JAVA"
- Comer "Computer Networks & Internet"
- Deitel & Deitel "Java™ How to Program, 6/E**"**
- Frouzan "Data communications and Networking"
- Gary Cornell "Core Java" The Sun Micro Systems Series

UNIX OPERATING SYSTEM AND SHELL PROGRAMMING

Course Code	L	T	P	Credit	Semester
BCI503	2	1	0	3	V

Course Learning Outcome:

CLO1: Identify the UNIX file system and its advantages.

CLO2: Describe the essential UNIX commands and shell programming.

CLo3: Apply and compare UNIX administration commands for privilege distribution.

CLO4: Implement different types of shell scripting programming.

Course Contents:

Module I: Introduction

History of Operating System, Types of Operating Systems, History of Unix, UNIX Family, Unix System Architecture, Kernel, Shell: Types of shells, Files and Directories, Absolute Path and Relative Path, root and hierarchical file structure of Unix, telnet.

Module II: UNIX Commands

Login, password, shell and commands, logout, changing password, current working directory, referring to home directories, Commands to move around by path concept, creating new directories, creating files–touch, cat; copying files; moving files, Deleting files and directories; looking at files: cat, more, pg, less, head, tail; Cal, banner, file, wc, sort, cut, grep ,cmp, comm., diff; Getting online help; manual pages; listing commands, meta characters, Wildcards; hidden files; Standard input and output; redirecting input and output; filter; pipes; file permissions; user and group; Interpreting file permissions; Permission Dependencies; Changing permissions. Managing file links; hard links; symbolic links; jobs and process: process ID; foreground and background jobs; suspend and interrupt a process; killing jobs;

Module III: VI Editor

Command mode, insert mode and last line mode; command to delete character, insert line; deleting text, command for moving the cursor; including other files; running shell commands; getting vi help; search and replace commands; changing and deleting text, Change word, Change line, Delete current line, Delete n lines, Delete remainder of Lines; copying and moving; Saving and Exiting.

Module IV: Shell programming:

Shell variables and Keywords, Shell scripts and execution methods, Interactive execution and command line arguments, ($1,$2 etc) meta Characters- Syntactic (&&, (), &, ‖, ;;, <, > etc), pattern matching, substitute shell variables, Test Command, Control Flow, For, If, While, Case. String handling and computation using expr, Setting positional parameters (set command), Shift.

Module V: System Administration

Adding and Removing Users, Starting up and Shutting down the System, Disk Management, File System Mounting and Unmounting, Monitoring System Usage, Ensuring System Security

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Kanetkar. “UNIX Shell Programming” BPB
- Sumitabha Das, “UNIX: Concepts and Application”, TMH.
- Das. “UNIX- Concepts & Applications

- Maurice J. Bach, "Design of the Unix operating System" PHI.

JAVA PROGRAMMING LAB

Course Code	L	T	P	Credit	Semester
BCI522	0	0	2	1	V

Course Learning Outcome:

CLO1: Identify the core concepts of Information Technology, both theoretical and applied;

CLO2: Investigate new technologies, tools, practices and standards, and relate to their knowledge domain.

CLO3: Acquaint with design and development tools, and engage in systematic evaluation using current methodologies;

CLO4: Demonstrate the ability to integrate IT knowledge and develop industry oriented projects.

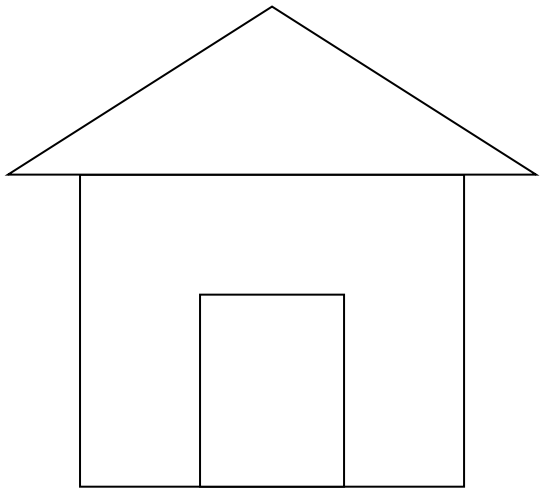
LIST OF PRACTICALS

1. Create a "Hello, World" program that simply prints out that statement.
2. Write a program that prints three arguments taken from the command line.
3. Write a program that prints values from 1 to 100.
4. Create a class with a default constructor (one that takes no arguments) that prints a message. Create an object of this class.
5. Write Java assignment statements to evaluate the following equations:
   (i) Energy = mass(acceleration*height+(velocity)sqr(2)/2)
   (ii) Torque = 2m1m2/m1+m2 * g
6. Design and write a Java program to define a class called Rectangle that contains members for representing its length and breadth. Provide members to get and set these attributes.
7. Design a class to represent a bank account. Include the following members:
   Data members:
   Name of the depositor
   Account number
   Type of account
   Balance amount in the account
   Methods:
   To assign initial values
   To deposit an amount
   To withdraw an amount after checking balance
   To display the name and balance
8. Write simple program to calculate the sum of digits of any number.
9. Write a simple program to display a "*" I triangle shape.
   Output will be like this

```
    *
   * * *
  * * * * *
```

10. Write a simple program to call a method called simple from a main function. The method simple should accept an integer as an argument and calculate the square of the number in the method simple.
11. Write a Java program to add two integers and two float numbers. When no arguments are supplied, give a default value to calculate the sum. Use method overloading to achieve this.

12. Write a program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Create another class called MultDiv that extends from AddSub class to use the member data of the superclass. MultDiv should have methods to multiply and divide. A main method should access the method and perform the mathematical operations.
13. Write an interface with a method called display. Implement this method I a class to display two names.
14. Write an interface that has two methods called push and pop of a stack. Write a class to implement the two methods for a fixed size stack creation.
15. Write a small program to catch Negative Array Size Exception. This exception is caused when the array is initialized to negative values.
16. Write a program to handle Null Pointer Exception and use the finally clause to display a message to the user.
17. Write a Java program that takes a string and converts it into uppercase and lowercase letters.
18. Write a Java program to find the volume of a sphere and a cone.
19. Write a Java program to convert rupees to dollars.
20. Write a Java program to find x to the power y. Use overloading for different cases when x and y are combinations of integer and floating point numbers.
21. Create an abstract class called Figure that has an abstract method called draw (). Make the subclasses called Filled_Rectangle, Filled_Arc and override the draw method in which you would print the message regarding the current object.
22. Write a Java program that has integer variables a, b, c and result as float. Store some values in them and apply the formula result = a/(b-c). Catch the probable exception.
23. Write a Java program that accepts two strings as command line arguments. It checks for the number of command line arguments. If they are less or more it throws an exception giving an appropriate message.
24. Write applets to draw the following shapes:
    (i) Cone
    (ii) Cylinder
    (iii) Cube
    (iv) Square inside a circle
    (v) Circle inside a square
25. Write an applet to display the following figure:



26. Write an applet to display a face.
27. Write an applet to display five buttons and five labels.
28. Write an applet to illustrate GridLayout.
29. Write a Java program to create 5 threads by extending Thread class.
30. Write a Java program to create 5 threads by implementing Runnable interface.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

UNIX OPERATING SYSTEM AND SHELL PROGRAMMING LAB

Course Code	L	T	P	Credit	Semester
BCI523	0	0	2	1	V

Course Learning Outcome:

CLO1: Identify the UNIX file system and its advantages.

CLO2. Describe the essential UNIX commands and shell programming.

CLO3. Apply and compare UNIX administration commands for privilege distribution.

CLO4. Implement different types of shell scripting programming.

LIST OF PRACTICALS

1. Write a Shell Script that takes a search string and filename from the terminal & displays the results.

2. Write a Shell Script that takes pattern and filename as command line arguments and displays the results appropriately i.e. pattern found/pattern not found.

3. Write a Shell Script that accepts only three arguments from the command line. The first argument is the pattern string, the second argument is the filename in which the pattern is to be searches and the third argument is the filename in which the result is to be stored.

4. Write a Shell Script that accepts a filename as a command line argument and finds out if its a regular file or a directory. If its a regular file, then performs various tests to see if it is readable, writeable, executable etc.

5. Write a Shell Script which creates the following menu and prompts for choice from user and runs the chosen command.

Today's date
Process of user
List of files
Quit to UNIX

6. Write a Shell Script that computes the factorial of a given number.

7. Write a Shell Script that works like a calendar reminding the user of certain things depending on the day of the week.

8. Write a Shell Script that changes the extension of a group of files from txt to doc

9. Write a Shell Script that accepts both filename and a set of patterns as positional parameters to a script.

10. Write a Shell Script which will redirect the output of the date command without the time into a file.

11. Write a Shell Script (using while loop) to execute endlessly (until terminated by user) a loop which displays contents of current directory, disk space status, sleep for 30 seconds and display the users currently logged in on the screen.

12. Write a Shell Script that receives two filenames as arguments. It should check whether content of the two files is same or not. If they are same, second file should be deleted.

13. If a number is input through the keyboard, WASS to calculate sum of its digits.

14. Write a Shell Script that performs a count-down either from 10 (default) or from the value that is entered by the user.

15. Write a Shell Script which takes a command line argument of Kms and by default converts that number into meters. Also provide options to convert km to dm and km to cm.

16. Write a Shell Script using for loop, which displays the message "Welcome to the UNIX System"

17. Write a Shell Script to change the filename of all files in a directory from lower-case to upper-case.

18. Write a Shell Script that examines each file in the current directory. Files whose names end in **old** are moved to a directory named **old files** and files whose names end in **.c** are moved to directory named **programs.**

19. Write a Shell Script which searches all files in the given directory (to be taken as command line argument) for the file having the title (to be taken as command line argument), as the first line in the file.

    a) Display the contents of the searched file.
    b) In the end, printthe the file is ###, where
    ### is small-sized if total no. of lines is <50
    ### is medium-sized if total no. of lines between 50&100
    ### is large-sized.

20. Write a shell script which reports names and sizes of all files in a directory (directory would be supplied as an argument to the shell script) whose size is exceeding 1000 bytes. The filenames should be printed in descending order of their sizes. The total number of such files should also be reported.

21. WASS for renaming each file in the directory such that it will have the current shell PID as an extension. The shell script should ensure that the directories do not get renamed.

22. WAP to calculate and print the first ***m*** Fibonacci numbers.

23. WASS that will receive any number of filenames as arguments. The shell script should check whether such files already exist. If they do, then it should be reported. The files that do not exist should be created in a sub-directory called **mydir**. The shell script should first check whether the sub-directory **mydir** exists in the current directory. If it doesn't exist, then it should be created. If **mydir** already exists, then it should be reported along with the number of files that are currently present in **mydir**.

24. A shell script receives even number of filenames. Suppose four filenames are supplied, then the first file should get copied into second file, the third file should get copied into fourth and so on. If odd number of filenames is supplied then no copying should take place and an error message should be displayed.

25. WASS to identify all zero-byte files in the current directory and delete them. Before proceeding with deletion, the shell script should get a conformation from the user.
26. WASS to compute the **GCD** and **LCM** of two numbers.
27. Two numbers are entered through the keyboard. WAP to find the value of one number raised to the power of another.
28. WASS that prompts the user for the password. The user has maximum of 3 attempts. If the user enters the correct password, the message "Correct Password" is displayed else the message "Wrong Password".

29. WASS that repeatedly asks the user repeatedly for the "Name of the Institution" until the user gives the correct answer.
30. WAP to generate all combinations of 1, 2 and 3 using **for loop.**

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

DEPARTMENTAL (DOMAIN) ELECTIVE
DESIGNING AND SUPPORTING COMPUTER NETWORK

Course Code	L	T	P	Credit	Semester
BCI531	2	1	0	3	V

Course Learning Outcome:

CLO1: Explain the principles and theories of design and supporting computer networks
CLO2: Able to describe infrastructures and creating the network design using IP addressing
CLO3: Discuss the possible prototyping the campus network and WAN with simulation

Course Contents:

Module I: Introducing Network Design Concepts

Discovering Network Design Basics, Investigating Core Layer Design Considerations, Investigating Distribution Layer Consideration, Investigating Access Layer Design Considerations, Investigating Server Farms and Security, Investigating Wireless Network Considerations, Supporting WANs and Remote Workers

Module II: Gathering Network Requirements

Introducing Cisco Lifecycle Services, Explaining the Sales Process, Preparing for the Design Process, Identifying Technical Requirements and Constraints, Identifying Manageability, Design Considerations

Module III: Characterizing the Existing Network

Documenting the Existing Network, Updating the Existing Cisco IOS, Upgrading Existing Hardware, Performing a Wireless Site Survey, Documenting Network Design Requirements

Module IV: Identifying Application Impacts on Network Design

Characterizing Network Applications, Explaining Common Network Applications, Introducing Quality of Service (QoS), Examining Voice and Video Options, Documenting Applications and Traffic Flows

Module V: Creating the Network Design

Analyzing the Requirements, Selecting the Appropriate LAN Topology, Designing the WAN and Remote Worker Support, Designing Wireless Networks, Incorporating Security

Module VI: Using IP Addressing in the Network Design

Creating an Appropriate IP Addressing Design, Creating the IP Address and Naming Scheme, Describing IPv4 and and IPv6

Module VII: Prototyping the Campus Network

Building a Prototype to Validate a Design, Prototyping the LAN, Prototyping Server Farm

Module VIII: Prototyping the WAN
Prototyping Remote Connectivity, Prototyping WAN Connectivity, Prototyping Remote Worker Support

Module IX: Preparing the Proposal
Assembling the Existing Proposal Information, Developing the Implementation Plan, Planning for the Installation, Creating and Presenting the Proposal

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- CCNA-Discovery 4.0, module 4, Cisco Certified Networking Academy
- Data Communication and Computer Network, Forozoun, TMH Publication
- Data Communication and Network, Stallings, PHI
- Computer Network, Tanenbaum, PHI

DATA WAREHOUSING & DATA MINING

Course Code	L	T	P	Credit	Semester
BCI532	2	1	0	3	V

Course Learning Outcome:

CLO1:Understand what data mining is and how data mining can be employed and applied to solve real problems.

CLO2:Recognize wither a data mining solution is feasible alternative for a specific problem.

CLO3:Apply basic statistical to evaluate the results of data mining models.

CLO4:Develop a comprehensive understanding of how several data mining techniques can be applied to solve problems.

CLO5: Understand the common designs and structures of warehouse systems.

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Course Contents:

Module I: Data Warehousing

Introduction to Data Warehouse, its competitive advantage, Data warehouse Vs Operational Data, Things to consider while building Data Warehouse

Module II: Implementation

Building Data warehousing team, Defining data warehousing project, data warehousing project management, Project estimation for data warehousing, Data warehousing project implementation

Module III: Techniques

Bitmapped indexes, Star queries, Read only table spaces, Parallel Processing, Partition views, Optimizing extraction process

Module IV: Data Mining

Introduction to Data Mining, benefits of Data Mining, How it helps in decision making, Data mining techniques, Introduction to Data Mart, Data Mart Tools, Data warehouse vs Data Mart, OLAP and its need, MOLAP and ROLAP

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Data Warehousing in the real world, Sam Anchory and Dennis Murray
- Data Mining, Pieter Adrians and Doif Zantinge

ANDROID PROGRAMMING

Course Code	L	T	P	Credit	Semester
BCI533	2	1	0	3	V

Course Learning Outcome

CLO1:Read and understand Java and Kotlin based software code of medium-to-high complexity.

CLO2:Understand the basic principles of creating Android applications with graphical user interface (GUI).

CLO3:Apply the above to design, implement, appropriately document and test anAndroid application of medium complexity, consisting of multiple activities.

CLO4:Understandactivity life cycle, intents and services, UI elements and understand the principles of developing nice user interface.

CLO5:Understand and use Storage in Android, SQLite, build android apps using media and location services.

Course Contents

Module –I: Introduction

Setting up development environment, Dalvik Virtual Machine & .apk file extension, Fundamentals, Basic Building blocks - Activities, Services, Broadcast Receivers & Content providers, UI Components - Views & notifications, Components for communication -Intents & Intent, Filters, Android API levels (versions & version names)

Module –II: Android Structure

AndroidManifest.xml, Uses-permission & uses-sdk, Resources & R.java, Assets, Layouts & Drawable Resources, Activities and Activity lifecycle, First sample Application

Module –III: Emulator – Android Virtual Machine

Launching emulator, Editing emulator settings, Emulator shortcuts, Logcat usage, Introduction to DDMS, Hello World App, Creating your first project, The manifest file, Layout resource, Running your app on Emulator, Second App:- (switching between activities),- Develop an app for demonstrating the, communication between Intents, Explicit Intents, Implicit intents

Module –IV: UI design

Time and Date, Images and media, Composite, Alert Dialogs & Toast, Popup, Examples, Option menu, Context menu, Sub menu, menu from xml, menu via code, Examples

Module –V: Adapters and Widgtes

Adapters:-Array Adapters. Base Adapters, ListView and List Activity, Custom listview, Grid View using adapters, Gallery using adapters

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Android Programming: The Big Nerd Ranch Guide (Big Nerd Ranch Guides) (By: Bill Philips & Brian Hardy
- Android Recipes: A Problem-Solution Approach, Dave Smith & Jeff Friesen

DESIGNING AND SUPPORTING COMPUTER NETWORK LAB

Course Code	L	T	P	Credit	Semester
BCI541	0	0	2	1	V

Course Learning Outcome:

CLO1: Explain the principles and theories of design and supporting computer networks

CLO2: Able to describe infrastructures and creating the network design using IP addressing

CLO3: Discuss the possible prototyping the campus network and WAN with simulation

LIST OF PRACTICALS

1. Process of Core Layer Design Consideration
2. Process of Access Layer Design Consideration
3. Preparing the Design Process, technical requirements.
4. Documentation Design of Existing Network in the Enterprise.
5. Document tation Design of Network Design Requirements.
6. Documenting application and traffic flow in Enterptrise network.
7. Selection of the Appropriate LAN Topology
8. Designing WAN and Wireless Network and Incorporating Security.
9. Creating an IP addressing Design with example enterprise network.
10. Prototype Design of LAN, Server Farm and WAN Connectivity.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

DATA WAREHOUSING AND DATA MINING LAB

Course Code	L	T	P	Credit	Semester
BCI542	0	0	2	1	V

Course Learning Outcome:

CLO1: visualize, gather information, articulate, analyze, solve complex problems, and make decisions. These are essential to address the challenges of complex and computation intensive problems increasing their productivity.

CLO2: to understand the various kinds of tools.
CLO3: Demonstrate the classification, clustering and etc. in large data sets.

CLO4: Ability to add mining algorithms as a component to the exiting tools.

CLO5: Ability to apply mining techniques for realistic data.

LIST OF PRACTICALS

1. Write a program to implement text mining.
2. Write a program to implement web mining.
3. Write a program to develop snowflake schema.
4. Write a program to develop the tree schema with the help of binary tree.
5. Write a program to implement BFS and DFS with respect to 2-D modeling.
6. Write a program to implement the basic step of informatics tool.

.**Examination Scheme:**

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

ANDROID PROGRAMMING LAB

Course Code	L	T	P	Credit	Semester
BCI543	0	0	2	1	V

Course Learning Outcome:

CLO1:Read and understand Java and Kotlin based software code of medium-to-high complexity.

CLO2:Understand the basic principles of creating Android applications with graphical user interface (GUI).

CLO3:Apply the above to design, implement, appropriately document and test an Android application of medium complexity, consisting of multiple activities.

CLO4:Understand activity life cycle, intents and services, UI elements and understand the principles of developing nice user interface.

CLO5: Understand and use Storage in Android, SQLite, build android apps using media and location services.

LIST OF PRACTICALS

1. Write a Program to Build a Simple Android Application
2. Java Andorid Program to Demonstrate Usage of String.xml File
3. Java Andorid Program to Demonstrate Activity Life Cycle
4. Write a Program to Change the Background of your Activity
5. Java Andorid Program to Perform all Operations using Calculators
6. Write a Program to Change the Image Displayed on the Screen
7. Write a Program to Create Multiple Activities within an Application
8. Write a Program to Demonstrate Action Button by Implementing on Click Listener
9. Write a Program to Demonstrate the Sound Button Application
10. Write a Program to Demonstrate the use of Scroll View
11. Write a Program to Demonstrate Radio Group Application
12. Write a Program to Demonstrate Alert Dialog Box
13. Write a Program to Set the Wallpaper of Your Device using Bitmap Class
14. Write a Program to Demonstrate the Menu Application
15. Write a Program to Demonstrate Toast in an Application
16. Write a Program for Dividing our Activity into Fully Encapsulated Reusable Components using Fragment
17. Write a Program to Demonstrate List View Activity
18. Write a Program to Draw on a Canvas
19. Write a Program to Demonstrate Count Down Timer Application
20. Write a Program to Demonstrate Layouts in an Activity and Nesting of Layouts
21. Write a Program to Demonstrate Grid View Layout in Android

22. Write a Program to Create Simple Menu in Android
23. Write a Program to Demonstrate Creating an Options Menu in Android
24. Write a Program to Demonstrate Menu Groups in Android
25. Write a Program to Demonstrate Checkable Menu Items in Android

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	15	15	15	25	25

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

SUMMER PROJECT – II (EVALUATION)

Course Code	L	T	P	Credit	Semester
BSI551	0	0	0	3	V

Course Learning Outcome:

CO1. Identify, Define and justify the scope of the proposed problem

CO3. Propose an optimized solution among the existing solutions

CO3. Apply to code, debugging, and testing tools for implementation

CO4. Prepare the proper documentation for report writing and oral presentation.

Guidelines:

There are certain phases of every Intern's professional development that cannot be effectively taught in the academic environment. These facets can only be learned through direct, on-the-job experience working with successful professionals and experts in the field. The internship program can best be described as an attempt to institutionalize efforts to bridge the gap between the professional world and the academic institutions. Entire effort in internship is in terms of extending the program of education and evaluation beyond the classroom of a university or institution. The educational process in the internship course seeks out and focuses attention on many latent attributes, which do not surface in the normal classroom situations. These attributes are intellectual ability, professional judgment and decision-making ability, inter-disciplinary approach, skills for data handling, ability in written and oral presentation, sense of responsibility etc.

In order to achieve these objectives, each student will maintain a file (**Internship File**). The Internship File aims to encourage students to keep a personal record of their learning and achievement throughout the Programme. It can be used as the basis for lifelong learning and for job applications. Items can be drawn from activities completed in the course modules and from the workplace to demonstrate learning and personal development.

The File will assess the student's analytical skills and ability to present supportive evidence, whilst demonstrating understanding of their organization, its needs and their own personal contribution to the organization.

The **layout guidelines** for the Project & Seminar Report:

1. File should be in the following specification:
A4 size paper
Font: Arial (10 points) or Times New Roman (12 points)
Line spacing: 1.5
Top & bottom margins: 1 inch/ 2.5 cm
Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components:
Front Page
Table of Content
Acknowledgement
Student Certificate
Company Profile (optional)
Introduction
Main Body
References / Bibliography

The File will include ***five sections*** in the order described below. The content and comprehensiveness of the main body and appendices of the report should include the following:

1. **The Title Page**--Title - An Internship Experience Report For (Your Name), name of internship organization, name of the Supervisor/Guide and his/her designation, date started and completed, and number of credits for which the report is submitted.
2. **Table of Content**--an outline of the contents by topics and subtopics with the page number and location of each section.
3. **Introduction**--short, but should include how and why you obtained the internship experience position and the relationship it has to your professional and career goals.
4. **Main Body**--should include but not be limited to daily tasks performed. Major projects contributed to, dates, hours on task, observations and feelings, meetings attended and their purposes, listing of tools and materials and their suppliers, and photographs if possible of projects, buildings and co-workers.
5. **References / Bibliography** --This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system

ASSESSMENT OF THE INTERNSHIP FILE

The student will be provided with the Student Assessment Record (SAR) to be placed in front of the Internship File. Each item in the SAR is ticked off when it is completed successfully. The faculty will also assess each item as it is completed. The SAR will be signed by the student and by the faculty to indicate that the File is the student's own work. It will also ensure regularity and meeting the delaines.

STUDENT ASSESSMENT RECORD (SAR)

5. Range of Research Methods used to obtain information

6. **Execution of Research**

7. **Data Analysis**
    - Analyse Quantitative/ Qualitative information
    - Control Quality

8. **Draw Conclusions**

Examination Scheme:

Components	**V**	**S**	**R**	**FP**
Weightage (%)	20	20	20	40

V – Viva, S – Synopsis, FP – Final Presentation, R - Report

Anandam

Course Code	L	T	P	Credit	Semester
AND005	2	0	0	2	V

Course Learning Outcome:

CLO1: Awareness and empathy regarding community issues
CLO2: Interaction with the community and impact on society
CLO3: Interaction with mentor and development of Student teacher relationship
CLO4: Interaction among students, enlarge social network
CLO5: Cooperative and Communication skills and leadership qualities Critical thinking, Confidence and Efficiency

Course Contents:

The project report should be guided by the mentor and shall contain:

- **Synopsis**: clearly stating objectives and activities to be undertaken. Problem identifying and problem-solving projects to be taken up.
- Details of the **Mentor and the Participants are to** be given (name of mentor, name of participants, phone number/mobile no, email, and address)
- Location / community where the work was carried out
- Details of Activities performed are to be given with date
- Number of beneficiaries and impact on the society (the object should be to empower the community and make them self-reliant)
- Photographs taken for documentation of work should be submitted
- Media coverage of the projects should be attached if any
- The Group Community Service Project Report will be submitted by the Student group leader under the guidance of the mentor to the Director/HoIs of the Department.
- The Director/HoIs should get the best report (more than one if required) of the Group Community Service Project uploaded on the HTE website and on the University page
- The Director/HoIs will forward the best report of the department to the Nodal Officer of the University.
- University will forward the report to the state level committee.

GUIDELINES FOR GCSP (Group Community Service Project)

ASSIGNMENT OF ANANDAM FOR SOCIAL AWARENESS (for students)

1. Each member of the group shall write one blog about the decided topic of 500 words (minimum) along with any relevant photos/diagrams/statistical data (with reference).
2. The group member shall write his/her name at the end of the blog.
3. The blog shall be posted on Instagram and Facebook (apart from these any other website wherever the group seems necessary).
4. Print out of the blog where date of when the content is posted, number of followers, comments, name of the writer shall be visible will be taken and file will be maintained for the same.
5. In the cover page of the project mention heading **"Group Community Service Project"**, and the filled format of final project report given by Anandam Scheme.

6. For the topic chosen by the group, students are recommended to cover the following points:
    a) Current scenario (Regional, national and international level as applicable)
    b) Future predictions
    c) Duty of the government
    d) Government policies (related to the topic), if any
    e) Duty of public
    f) Conclusion

Evaluation Scheme:

Project Participation: 2 hours X 8 days (per month) X 4 months = 64 hours

- **C grade =32 hrs (Below 20 marks)**
- **B grade >32 hrs to <=44hrs (20-30 marks)**
- **A grade >44 hrs to<=54hrs (30-40 marks)**
- **O grade >54 hrs to<=64hrs (40-50 marks)**

Evaluation Criteria:

Respective Departmental Anandam mentors are requested to evaluate the project (out of 50) as per the following criteria:

1. Position and exceptions, if any, are clearly stated. The organization of the blog is completely and clearly outlined and implemented.
2. The body of the blog is coherently organized, original and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear, concise, and persuasive.
3. Conclusion is clearly stated. The underlying logic is explicit.

COMMUNICATION SKILLS - III

Course Code	L	T	P	Credit	Semester
BCS501	1	0	0	1	V

B. COURSE LEARNING OUTCOMES (CLO)

CLO 1	Create right selection of words and ideas while also choosing the appropriate channelof formalcommunication.
CLO 2	Demonstrate the ability to analyse a problem and devise a solution in a group.
CLO 3	Demonstrate proficiency in the use of written communication.
CLO 4	Recognize the mannerisms and methodology of Interview and GD to become

	more expressive in their body language and verbal performance.

B. SYLLABUS

Topic
Email Writing (Briefing, Do's & Don'ts & Practice)
Corporate Dressing & Body Language (Verbal & Non-Verbal Cues & its role in Interview Selection)
Interview-1 (Briefing, Do's & Don'ts, Questions, Mock Sessions)
GD-3(Practice Sessions)

EXAMINATION SCHEME:

Components	Email Writing	GD	Personal Interview	Attendance
Weightage (%)	30	30	35	5

SUGGESTED READINGS

- Essential Telephoning in English, Garside/Garside, Cambridge
- Working in English, Jones, Cambridge
- Dr. P.Prasad. *Communication Skills*.S.K.Kataria&Sons
- Koneru, Aruna. *Professional Communication.* The McGraw Hill: New Delhi, 2008. Print
- Krishnaswamy N,*Creative English for Communication***.** Delh**i:** Macmillan Publishers India Ltd. Print. 2007.

BEHAVIOURAL SCIENCE - V
(INDIVIDUAL, SOCIETY AND NATION)

Course Code	L	T	P	Credit	Semester
BSS503	1	0	0	1	V

Course Learning Outcome:

1. Recognize their personality and individual differences and identify its importance of diversity at workplace and ways to enhance it.
2. Recognize effective socialization strategies and importance of patriotism and taking accountability of integrity.
3. Recognize different types of human rights and its importance.
4. Identify Indian values taught by different religions.
5. Identify long term goals and recognize their talent, strengths and styles to achieve them.

Course Contents:

Module I: Individual differences & Personality
Personality: Definition& Relevance
Importance of nature & nurture in Personality Development
Importance and Recognition of Individual differences in Personality
Accepting and Managing Individual differences (Adjustment Mechanisms)
Intuition, Judgment, Perception & Sensation (MBTI)
BIG5 Factors

Module II: Socialization
Nature of Socialization
Social Interaction
Interaction of Socialization Process
Contributions to Society & Nation

Module III: Patriotism and National Pride
Sense of Pride and Patriotism
Importance of Discipline and hard work
Integrity and accountability

Module IV: Human Rights, Values and Ethics
Meaning of Human Rights
Human Rights Awareness
Importance of human rights
Values and Ethics- Learning based on project work on Scriptures like Ramayana, Mahabharata, Gita etc

Module V: Personal and Professional Excellence

- Personal excellence:
    - Identifying Long-term choices and goals
    - Uncovering talent, strength and style

Alan P. Rossiter's eight aspects of Professional Excellence
Resilience during challenge and loss
Continued Reflection (Placements, Events, Seminars, Conferences, Projects, Extracurricular Activities, etc.)

Examination Scheme:

Components	SAP	A	Mid Term Test (CT)	VIVA	Journal for Success (JOS)
Weightage (%)	20	05	20	30	25

Text & References:

- Bates, A. P. and Julian, J.: Sociology - Understanding Social Behaviour
- Dressler, David and Cans, Donald: The Study of Human Interaction
- Lapiere, Richard. T – Social Change
- Rose, G.: Oxford Textbook of Public Health, Vol.4, 1985.
- Robbins O.B. Stephen; Organizational Behaviour

FRENCH - V

Course Code	L	T	P	Credit	Semester
FLT501	2	0	0	2	V

Course Learning Outcome:

CLO1: Students will hone intermediate language skills such as reading, writing, speaking, listening & interactive) in the language
CLO2: Students will be able to read and interpret small texts of intermediate level.
CLO3: Students will be able to communicate in small sentences in Simple Future and Past tenses .
CLO4: Students will be able to communicate in oral in small sentences in Simple Future and Past tenses. etc.

Course Contents:

Module D: pp. 131 – 156 Unités 10, 11

Contenu lexical:

Unité 10: Prendre des décisions

1. Faire des comparaisons
2. décrire un lieu, le temps, les gens, l'ambiance
3. rédiger une carte postale

Unité 11: faire face aux problèmes

1. Exposer un problème.
2. parler de la santé, de la maladie
3. interdire/demander/donner une autorisation
4. connaître la vie politique française

Contenu grammatical:

1. comparatif - comparer des qualités/ quantités/actions
2. supposition: Si + présent, futur
3. adverbe - caractériser une action
4. pronom "Y"

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1

GERMAN - V

Course Code	L	T	P	Credit	Semester
FLG501	2	0	0	2	V

Course Learning Outcome:

CLO1: Students will hone intermediate language skills such as reading, writing, speaking, listening & interactive) in the language
CLO2: Students will be able to read and interpret small texts of intermediate level.
CLO3: Students will be able to communicate in small sentences in Simple Future and Past tenses .
CLO4: Students will be able to communicate in oral in small sentences in Simple Future and Past tenses. etc.

Course Contents:

Module I: Genitive case
Genitive case – Explain the concept of possession in genitive
Mentioning the structure of weak nouns

Module II: Genitive prepositions
Discuss the genitive propositions and their usage: (während, wegen, statt, trotz)

Module III: Reflexive verbs
Verbs with accusative case
Verbs with dative case
Difference in usage in the two cases

Module IV: Verbs with fixed prepositions
Verbs with accusative case
Verbs with dative case
Difference in the usage of the two cases

Module V: Texts
A poem 'Maxi'
A text Rocko

Module VI: Picture Description
Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2

- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

SPANISH - V

Course Code	L	T	P	Credit	Semester
FLS501	2	0	0	2	V

Course Learning Outcome:

CLO1: Students will hone intermediate language skills such as reading, writing, speaking, listening & interactive) in the language
CLO2: Students will be able to read and interpret small texts of intermediate level.
CLO3: Students will be able to communicate in small sentences in Simple Future and Past tenses .
CLO4: Students will be able to communicate in oral in small sentences in Simple Future and Past tenses. etc.

Course Contents:

Module I
Revision of earlier semester modules

Module II
Future Tense

Module III
Presentations in English on
Spanish speaking countries'
Culture
Sports
Food
People
Politics
Society
Geography

Module IV
Situations:
En el hospital
En la comisaria
En la estacion de autobus/tren
En el banco/cambio

Module V
General revision of Spanish language learnt so far.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español Sin Fronteras, Greenfield

CHINESE – V

Course Code	L	T	P	Credit	Semester
FLC501	2	0	0	2	V

Course Learning Outcome:

CLO1: Students will hone intermediate language skills such as reading, writing, speaking, listening & interactive) in the language
CLO2: Students will be able to read and interpret small texts of intermediate level.
CLO3: Students will be able to communicate in small sentences in Simple Future and Past tenses .
CLO4: Students will be able to communicate in oral in small sentences in Simple Future and Past tenses. etc.

Course Contents:

Module I
Drills
Dialogue practice
Observe picture and answer the question.
Pronunciation and intonation.
Character writing and stroke order

Module II
Intonation
Chinese foods and tastes – tofu, chowmian, noodle, Beijing duck, rice, sweet, sour….etc. Learning to say phrases like – Chinese food, Western food, delicious, hot and spicy, sour, salty, tasteless, tender, nutritious, god for health, fish, shrimps, vegetables, cholesterol is not high, pizza, milk, vitamins, to be able to cook, to be used to, cook well, once a week, once a month, once a year, twice a week……
Repetition of the grammar and verbs taught in the previous module and making dialogues usingit.
Compliment of degree "de".

Module III
Grammar the complex sentence "suiran … danshi…."
Comparison – It is colder today than it was yesterday…..etc.
The Expression "chule….yiwai". (Besides)
Names of different animals.
Talking about Great Wall of China
Short stories

Module IV
Use of "huozhe" and "haishi"
Is he/she married?
Going for a film with a friend.
Having a meal at the restaurant and ordering a meal.

Module V

Shopping – Talking abut a thing you have bought, how much money you spent on it? How many kinds were there? What did you think of others?
Talking about a day in your life using compliment of degree "de". When you get up? When do you go for class? Do you sleep early or late? How is Chinese? Do you enjoy your life in the hostel?
Making up a dialogue by asking question on the year, month, day and the days of the week and answer them.

Examination Scheme:

Components	CT1	CT2	C	I	V	A
Weightage (%)	20	20	20	20	15	5

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- "Elementary Chinese Reader " Part-II Lesson 39-46

INTRODUCTION TO ENTERPRISE RESOURCE PLANNING

Course Code	L	T	P	Credit	Semester
BSI601	2	1	0	3	VI

Course Learning Outcome:

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CLO1: Provides overview of the E waste management life cycle emphasizing analytical techniques to develop the correct definition of business problems and user requirements.

CLO2: The scale of current and predicted global e-waste, and how much is collected and recycled.

CLO3: Understand the environmental, social and health impacts of unsound e-waste recycling.

CLO4: How electrical product life cycles of can have negative or positive impacts on climate change.

various stakeholders.

Course Contents:

Module I: Introduction

Definition, Evolution of ERP, Characteristics, Features, Components and needs of ERP, Key ERP Vendors, Evaluation Criteria of ERP packages, System & Business Benefits & Limitations of ERP, Implementation approach of ERP (General Implementation Methodology & Vanilla Implementation), Guidelines for ERP Implementation.

Module II: Enterprise Modeling and Integration of ERP

Why to model the enterprise? Implications of ERP for Management, Needs to focus on Enterprise Integration/ERP, Information mapping, Role of common shared Enterprise database, Linkages of Enterprise, Generic model of ERP system, Core Modules of ERP, Client Server Architecture, Web-based Architecture, Service oriented Architecture.

Module III: Supply chain management and ERP

Definition, Stevens Model of Supply Chain Management, SCOR Model, Aims of SCM, Key Issues, Benefits of SCM, ERP Vs SCM.

Module IV: Information Technology Plan for ERP system

Enabling Best Practices, Benchmarking, System Integration (Physical & Logical) – Pros & Cons, Role of ERP in Physical Integration, BPR (Business Process Reengineering) – Process & Tools of BPR.

Module V: SAP Architecture & Other ERP Key Vendors

Introduction to SAP, SAP architecture, Scalability, SAP R/3 System and mySAP, Integrated SAP Model, Integrated processes, Introduction to Baan and Peoplesoft.

Module VI: Selection of ERP

Introduction, Difficulty in selecting ERP, Approach to ERP selection, Request for Proposal approach, Proof-of-Concept approach.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Enterprise Systems For Management, Luvai F. Motiwalla, Jeff Thompson, Pearson Education.
- Enterprise Resource Planning, Ravi Shankar, S.Jaiswal, Galgotia Publication Pvt. Ltd.

E-WASTE MANAGEMENT

Course Code	L	T	P	Credit	Semester
BSI602	2	1	0	3	VI

Course Learning Outcome:

CLO1 Introduction

CLO2. Enterprise Modelling and Integration of ERP.

CLO3. Supply chain management and ERP.

CLO4. Information Technology Plan for ERP system.

CLO5. SAP Architecture & Other ERP Key Vendors.

Course Contents:

Module 1

E-Waste Introduction, Global E-Waste Problem, Scale of the e-waste problem, flow of e-waste, Causes of E-Waste, Toxins in Ewaste, e-waste trade, illegal e-waste trade, Main issues related to E-waste, Security implications

Module II

Risks to human health and the environment, Biological Effects of E-Waste Chemicals, Organic E-Waste Chemicals, Chemicals of primary concern in e-waste, The cocktail effect and metabolites, Classification and labeling of chemicals, Labor and employment issues, Workers' exposure in developing countries, Child labor at e-waste recycling sites

Module III

Recycling of Ewaste- Wheel of Life, ewaste handling, Business Model for E-Waste, Myth of Reuse, E-Waste Recycling Plants, Recycling of Component Materials in Electronic Devices, Solutions to the E-Waste Crisis, Producer Responsibility For Recycling, Global E-Waste Dumping, Case Study on Recycling of E-Waste,

Module IV

Risk Assessment Approaches for E-Waste, Systems analysis approach to the e-waste problem, Risk Communication Approaches for E-Waste Sites, Current Gaps in the E-Waste Database, Future directions for managing E-Waste, E- Waste Legislations, Regional legislation, National legislation, Current initiatives, research centers and organizations involved with e-waste.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE

Weightage (%)	15	10	10	10	5	50

Text & Reference:

- E-waste Management: From Waste to Resource by Ramzy Kahhat, Klaus Hieronymi, Eric Williams, Routledge, Taylor & Franics Group
- Electronic Waste Management: Design, Analysis and Application by Ronald E. Hester, Roy M. Harrison, RSC Publishing
- E-waste: implications, regulations, and management in India and current global best practices by Rakesh Johri, TERI Press (The Energy and Resource Institute)
- Electronic Waste: Recycling Techniques by Hugo Marcelo Veit, Andréa Moura Bernardes, Springer Publications
- Risks of Hazardous Wastes By Paul E. Rosenfeld, Lydia Feng, Elsevier Inc.
- Waste: A Handbook for Management by Trevor M. Letcher, Daniel Vallero, Elsevier Inc.

GREEN COMPUTING

Course Code	L	T	P	Credit	Semester
BSI603	2	1	0	3	VI

Course Learning Outcome:

CLO1: To learn the fundamentals of Green Computing this includes the overview, issues, initiatives, and standards worldewide.

CLO 2: To analyze the Green computing Grid Framework in terms of minimizing power usage and cooling.

CLO 3: To understand the issues related with Green compliance to change the way of work and going paperless.

CLO 4: To study and develop various case studies involving recycling, hardware consideration and greening the information system.

Course Contents:

Module 1

Overview and Issues: Problems: Toxins, Power Consumption, Equipment Disposal, Company's Carbon Footprint: Measuring, Details, reasons to bother, Plan for the Future, Cost Savings: Hardware, Power.

Initiatives and Standards: Global Initiatives: United Nations, Basel Action Network, Basel Convention, North America: The United States, Canada, Australia, Europe, WEEE Directive, RoHS, National Adoption, Asia: Japan, China, Korea.

Module II

Minimizing Power Usage: Power Problems, Monitoring Power Usage, Servers, Low-Cost Options, Reducing Power Use, Data De-Duplication, Virtualization, Management, Bigger Drives, Involving the Utility Company, LowPower Computers, PCs, Linux, Components, Servers, Computer Settings, Storage, Monitors, Power Supplies, Wireless Devices, Software.

Cooling: Cooling Costs, Power Cost, Causes of Cost, Calculating Cooling Needs, Reducing Cooling Costs, Economizers, On-Demand Cooling, HP's Solution, Optimizing Airflow, Hot Aisle/Cold Aisle, Raised Floors, Cable Management, Vapour Seal, Prevent Recirculation of Equipment Exhaust, Supply Air Directly to Heat Sources, Fans, Humidity, Adding Cooling, Fluid Considerations, System Design, Datacentre Design, Centralized Control, Design for Your Needs, Put Everything Together.

Module III

Changing the Way of Work: Old Behaviours, starting at the Top, Process Reengineering with Green in Mind, Analysing the Global Impact of Local Actions, Steps: Water, Recycling, Energy, Pollutants, Teleworkers and Outsourcing, Telecommuting, Outsourcing, how to Outsource.

Going Paperless: Paper Problems, The Environment, Costs: Paper and Office, Practicality, Storage, Destruction, Going Paperless, Organizational Realities, Changing Over, Paperless Billing, Handheld Computers vs. the Clipboard, Unified Communications, Intranets, What to

Include, Building an Intranet, Microsoft Office SharePoint Server 2007, Electronic Data Interchange (EDI), Nuts and Bolts, Value Added Networks, Advantages, Obstacles.

Module IV

Recycling: Problems, China, Africa, Materials, Means of Disposal, Recycling, Refurbishing, Make the Decision, Life Cycle, from beginning to end, Life, Cost, Green Design, Recycling Companies, Finding the Best One, Checklist, Certifications, Hard Drive Recycling, Consequences, cleaning a Hard Drive, Pros and cons of each method, CDs and DVDs, good and bad about CD and DVDs disposal, Change the mind-set, David vs. America Online

Hardware Considerations: Certification Programs, EPEAT, RoHS, Energy Star, Computers, Monitors, Printers, Scanners, All-in-Ones, Thin Clients, Servers, Blade Servers, Consolidation, Products, Hardware Considerations, Planned Obsolescence, Packaging, Toxins, Other Factors, Remote Desktop, Using Remote Desktop, Establishing a Connection, In Practice

Module V

Greening Your Information Systems: Initial Improvement Calculations, Selecting Metrics, Tracking Progress, Change Business Processes, Customer Interaction, Paper Reduction, Green Supply Chain, Improve Technology Infrastructure, Reduce PCs and Servers, Shared Services, Hardware Costs, Cooling.

Staying Green: Organizational Check-ups, Chief Green Officer, Evolution, Sell the CEO, SMART Goals, Equipment Check-ups, Gather Data, Tracking the data, Baseline Data, Benchmarking, Analyze Data, Conduct Audits, Certifications, Benefits, Realities, and Helpful Organizations.

Examination Scheme:

Components	CT	Assignment	P/V	Quiz	Attd	EE
Weightage (%)	15	10	10	10	5	50

Text & References:

- Green IT, Toby Velte, Anthony Velte, Robert Elsenpeter, McGraw Hill, 2008
- Green Data Center: Steps for the Journey, Alvin Galea, Michael Schaefer, Mike Ebbers, Shroff Publishers and Distributers, 2011
- Green Computing Tools and Techniques for Saving Energy, Money and Resources, Bud E. Smith, CRC Press, 2014

MAJOR PROJECT

Course Code	L	T	P	Credit	Semester
BSI660	0	0	0	15	VI

Course Learning Outcome:

CO1. Identify the proposed problem

CO2. Develop a functional application based on the software design

CO3. Apply to code, debugging, and testing tools for implementation

CO4. Prepare the proper documentation for report writing and oral presentation.

GUIDELINES FOR PROJECT FILE

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation.

Research is genuine exploration of the unknown that leads to new knowledge, which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include:

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals.
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

Report Layout

The report should contain the following components:

1. File should be in the following specification:

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

2. Report Layout: The report should contain the following components

Front Page

Table of Contents

Acknowledgement

Student Certificate
Company Profile
Introduction
Chapters
Appendices
References / Bibliography

- **Title or Cover Page or Front Page**
  The title page should contain the following information: Project Title; Student's Name; Course; Year; Supervisor's Name.

- **Table of Contents**

Titles and subtitles are to correspond exactly with those in the text.

- **Acknowledgement**

Acknowledgment to any advisory or financial assistance received in the course of work may be given.

- **Student Certificate**
  Given by the Institute.
- **Company Certificate & Profile**
  This is a certificate, which the company gives to the students. A Company Profile corresponds to a file with company-specific data. Company data can be stored there and included in a booking when needed.
- **Introduction**
  Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.
- **Chapters**
  All chapters and sections must be appropriately numbered, titled and should neither be too long nor too short in length.
  The first chapter should be introductory in nature and should outline the background of the project, the problem being solved, the importance, other related works and literature survey. The other chapters would form the body of the report. The last chapter should be concluding in nature and should also discuss the future prospect of the project.
- **Appendices**
  The Appendix contains material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.
- **References / Bibliography**
  This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project. Project execution is concerned with assessing how much work has been put in.

The File should fulfill the following ***assessment objectives:***

1. **Range of Research Methods used to obtain information**
2. **Execution of Research**
3. **Data Analysis**

- Analyze Quantitative/ Qualitative information
- Control Quality

4. **Draw Conclusions**

Examination Scheme:

Components	**MRP**	**V**	**S**	**FP**	**R**
Weightage (%)	20	20	20	20	20

MRP – Mid Report Presentation, V – Viva, S – Synopsis, FP – Final Presentation, R - Report