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
2020-2022

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 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)-2020

Semester	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	0	0	0	00	0	0	00	0

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)-2020

Semester	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	0	0	0	00	0	0	00	0

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
2020-22

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				
MCA132	Theory of Computation	DE	2	1	-	3
MCA133	Analysis and Design of Algorithms	DE				
Elective-II (With Lab)	**Select any ONE**					
MCA134	Computer Graphics	DE				
MCA135	Data Warehousing and Mining	DE	2	1	-	3
MCA136	Open Source Technology	DE				
MCA137	Network Fundamental	DE				
MCA144	Computer Graphics Lab	DE				
MCA145	Data Warehousing and Mining Lab	DE				
MCA146	Open Source Technology Lab	DE	-	-	2	1
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
FLT111	Foreign Language French	VA				
FLG111	German	VA	2	-	-	2
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				
MCA332	Digital Marketing Analytics	DE				
MCA333	Compiler Design	DE	2	1	-	3
MCA334	Digital Image Processing	DE				
MCA335	Salesforce Technology	DE				
Elective-II (With Lab)	**Select any ONE**					
MCA336	LAN Switching & Wireless	DE				
MCA337	Python	DE	2	1	-	3
MCA338	Big Data & Analytic using R	DE				
MCA339	Android Programming	DE				
MCA346	LAN Switching & Wireless Lab	DE				
MCA347	Python Lab	DE	-	-	2	1
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
FLT311	Foreign Language					
	French	VA				
FLG311	German	VA	2	-	-	2
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
MCA 101	2	1	-	3

Course Objective:

Students will learn the tools and techniques of quantitative analysis outlined in the schedule, how and when to apply them, and practice application of those tools. Students completing this goal will be prepared to quantify a variety of policy problems for analysis and decision making. The syllabus includes Linear, Non-linear Programming, Transportation, Decision Theory and Project Management.

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
MCA102	2	1	-	3

Course Objective:

This course will introduce the architecture of java programming. At the same time it provides the detail information Java programming concepts like classes, inheritance, packages, exception handling, file handling and applet programming. This course also includes GUI components, AWT and event handling.

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
MCA 103	2	1	-	3

Course Objective:

To familiarize students with the advance database management system fundamentals and make students enable to deal with advance SQL query, indexing, optimization, concurrency control etc. and ADBMS administration works.

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
MCA122	-	-	2	1

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

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

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

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

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

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

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

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

11 Write a program to show the use of typecasting.

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

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

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

15 Write a program to sort element of an array.

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

17 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

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

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

20 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.

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

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

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

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

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

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

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

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

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

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

31 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.

32 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.

33 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.

34 Write a program to show the use of super.

35 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.

36   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.

37   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.

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

39   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.

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

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

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

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

44   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.

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

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

47   Write a program to write bytes to a file.

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

49   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.

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

51   Write an applet program to print Hello.

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

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

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

55   Write an applet program to draw bar charts.

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

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

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

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

59 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:

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

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

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

63 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.

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

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

66 Write a program to expand ring on mouse click.

67 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
MCA123	-	-	2	1

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
MCA131	**2**	**1**	**-**	**3**

Course Objective:

The objective of this subject is to make students familiar about the basic concepts mobile technology, computing and market

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
MCA 132	2	1	-	3

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
MCA 133	2	1	-	3

Course Objective:

The primary objective of this course is to provide the fundamentals concepts of Design & analysis of Algorithms. To provides knowledge of Time and space complexity of algorithms. This course is to including 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 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
MCA 134	2	1	-	3

Course Objective:

The course provides the necessary theoretical background for introductory computer graphics and demonstrates the application of computer science to graphics. It also offers an opportunity for students to formulate and implement applications of computer graphics. This course further allows students to develop programming skills in computer graphics by programming assignments.

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
MCA 135	2	1	-	3

Course Objective:

This course unit is divided into two parts: one on Data Warehousing and one on Data Mining. Both data warehousing and data mining are advanced recent developments in database technology which aim to address the problem of extracting information from the overwhelmingly large amounts of data which modern societies are capable of amassing. Data warehousing focuses on supporting the analysis of data in a multidimensional way. Data mining focuses on inducing compressed representations of data in the form of descriptive and predictive models. Course gives an in-depth knowledge of both the concepts.

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
MCA 136	2	1	-	3

Course Objective:
The primary objective of this course is to understand all the components of XML. An understanding of some advanced open source issues, including elements, attributes, namespace, reference etc The ability to write xml code.

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
MCA137	2	1	-	3

Course Objective:

The goal of CCNA Exploration Network Fundamentals course is to introduce you to fundamental networking concepts and technologies. This course will assist you in developing the skills necessary to plan and implement small networks across a range of applications.

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
MCA 144	-	-	2	1

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
<div align="center">

Human Face Generation
</div>

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:
```
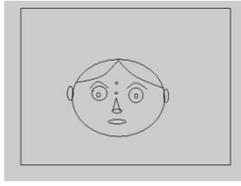
Ex. No. 6
2D Transformation - Rectangle
Aim:
To create a rectangle and apply 2D transformations like Scaling, Rotation and Translation.
Algorithm:
Step 1: Include the graphics header file
Step 2: Initialize graphics using initgraph()
Step 3: Initialize the variables
Step 4: Enter the choice for transformation
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
　　　　　　　$x' = x*\cos\theta - y*\sin\theta$
　　　　　　　$y' = x*\sin\theta + y*\cos\theta$
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
　　　　　　　$x' = x*\cos\theta - y*\sin\theta$
　　　　　　　$y' = x*\sin\theta + y*\cos\theta$
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
$$x' = x*\cos\theta - y*\sin\theta$$
$$y' = x*\sin\theta + y*\cos\theta$$
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
$$y' = y*\cos\theta - z*\sin\theta$$
$$z' = y*\sin\theta + z*\cos\theta$$
$$x' = x$$
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
MCA 145	-	-	2	1

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.

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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 Objective:

• Write basic XML scripts that process user input from a web form.

• Use XML variables, arrays, loops, conditional statements, and operators.

• Create and incorporate XML functions.

• Integrate XML scripts with email

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 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.

3.0 TCP/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

10.0 Subnet 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
MCA 151	-	-	-	**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:
  - o Entire activity plan
  - o Route Map
  - o What are the objectives for the students?
  - o What they need to learn, do, and prepare before the conference / seminar / workshop?
  - o List of prospective students with Contact Details
  - o 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

COMMUNICATION SKILLS – I

Course Code	L	T	P	Credit
BCS111	1	-	-	1

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-I
(SELF DEVELOPMENT AND INTERPERSONAL SKILLS))

Course Code	L	T	P	Credit
BSS111	1	-	-	1

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 – I

Course Code	L	T	P	Credit
FLT111	2	-	-	2

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
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 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 – I

Course Code	L	T	P	Credit
FLS111	2	-	-	2

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 – I

Course Code	L	T	P	Credit
FLC111	2	-	-	2

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

SOFTWARE ENGINEERING & PROJECT MANAGEMENT

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

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
MCA 202	2	1	-	3

Course Objective:
The objective is to equip the students with the advanced feature of contemporary java which would enable them to handle complex programs relating to managing data and processes over the network. The major objective of this course is to provide a sound foundation to the students on the concepts, precepts and practices, in a field that is of immense concern to the industry and business.

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
MCA 203	2	1	-	3

Course Objective:

This Subject provides students with an in-depth knowledge about the operating system. The former treats the standard principles of single processor system, including processes, synchronization, I/O, deadlocks, Memory Management, File Management systems, security and so on. This subject covers distributed operating system in detail, including communication process, file system and memory management synchronization and so on but this time in the context of distributed systems

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
MCA221	-	-	2	1

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
MCA 222	-	-	2	1

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.

    You can use as many classes to make it more users friendly and graphical.
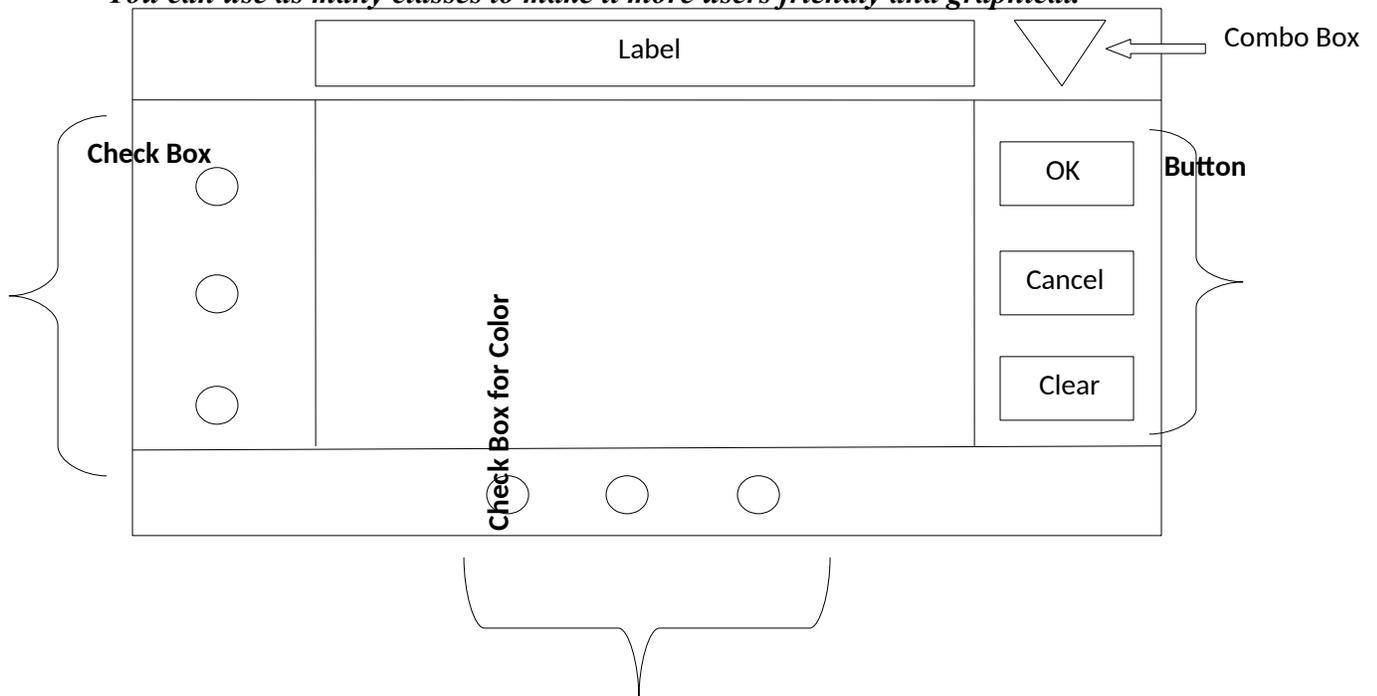
6. Write a java program to handle an event in a Swing.

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
MCA 231	2	1	-	3

Course Objective

- To understand the concept of Virtualization and design of cloud Services
- To introduce the broad perceptive of cloud architecture and model
- To learn to design the trusted cloud Computing system
- To apply different cloud programming model as per need.
- To understand the features of cloud simulator
- To be familiar with the lead players in 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
MCA 232	2	1	-	3

Course Objective:

Soft computing has emerged as one of the vital fields within computer science, where solutions for a complex problem can be obtained by incorporating certain processes resembling biological and nature- inspired phenomena. These processes are used intelligently in places where solutions cannot be obtained especially in polynomial time and often remain intractable to conventional mathematical and analytical methods.

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
MCA 233	2	1	-	3

Course Objective:

The objective of this course is to learn how to improve the quality of the programs that you write for execution on high performance computer systems.The course discusses the various activities that happen during program execution, and how they are managed by the hardware (architectural features) and system software (operating systems, run-time systems).

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
MCA 234	2	1	-	3

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
MCA 235	2	1	-	3

Course Objective:

The course focuses on advanced IP addressing techniques Variable Length Subnet Masking (VLSM), advanced IP addressing technique (Network Address Translation and terminology, PPP, ISDN, DDR, Frame Relay, network security, ACLs, Teleworker services and network troubleshooting, In addition the student will prepare for taking the CCNA Exam.

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
MCA 236	2	1	-	3

Course Objective:

To create web based applications using ASP.NET.

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
MCA 237	2	1	-	3

Course Objective:
- Write basic PHP scripts that process user input from a web form.
- Use PHP variables, arrays, loops, conditional statements, and operators.
- Create and incorporate PHP functions.
- Integrate PHP scripts with email

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-ma**il**

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
MCA 238	2	1	-	3

Course Objective:
The goal of CCNA Exploration Routing Protocols and Concepts course is to develop an understanding of how a router learns about remote networks and determines the best path to those networks. This course includes both static routing and dynamic routing protocols.

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
MCA 239	2	1	-	3

Course Objective:

Statistical learning refers to a set of tools for modeling and understanding complex datasets. It is a recently developed area in statistics and blends with parallel developments in computer science and, in particular, machine learning. The field encompasses many methods such as the lasso and sparse regression, classification and regression trees, and boosting and support vector machines. an introduction to the basic principles, techniques, and applications of Artificial Intelligence.

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
MCA 246	-	-	2	1

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
MCA 247	-	-	2	1

Course Code: MCA422   **P:02 C:01**

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
MCA 248	-	-	2	1

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

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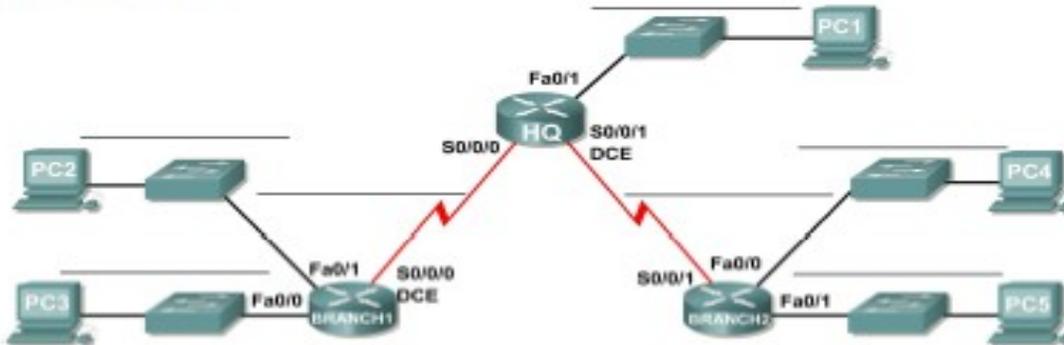
- Determine the number of subnets needed.
- Determine the number of hosts needed.
- Design an appropriate addressing scheme.
- Assign addresses and subnet mask pairs to device interfaces and hosts.
- Examine the use of the available network address space.
- Determine how static routing could be applied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

7.0 Subnetting Scenario 2

Topology Diagram
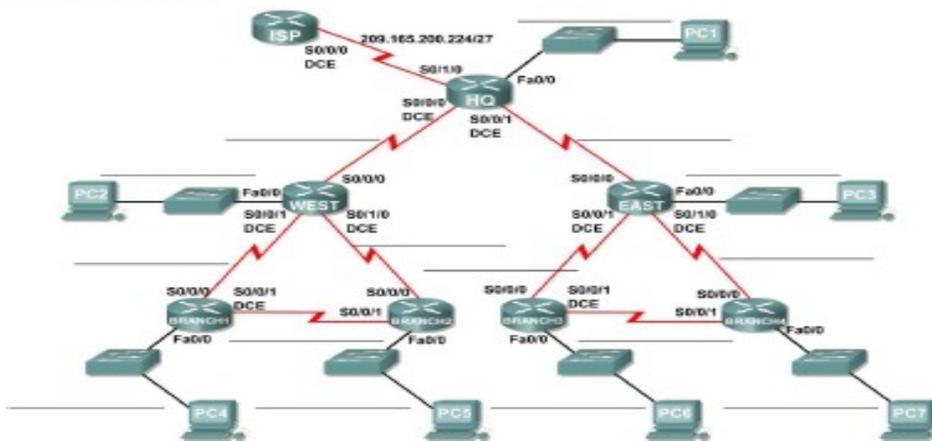
Determine the number of subnets needed.

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.
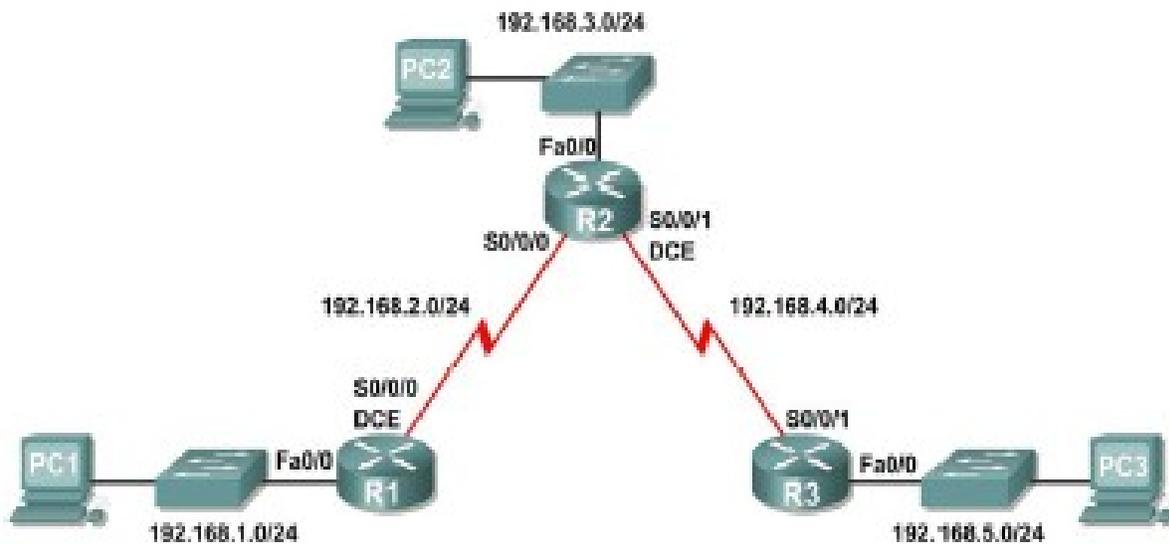- Observe automatic summarization at boundary router.

- 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
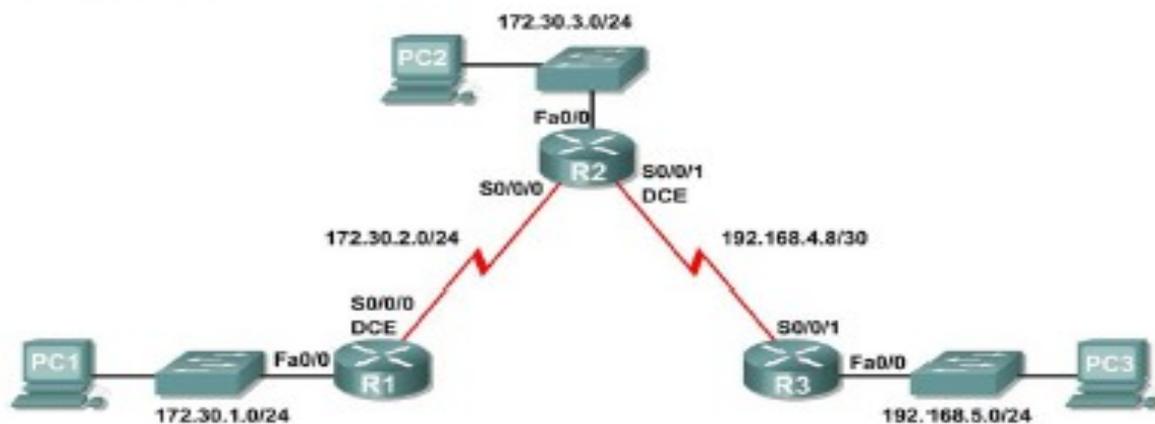
Scenario A: Running RIPv1 on Classful Networks

Topology Diagram

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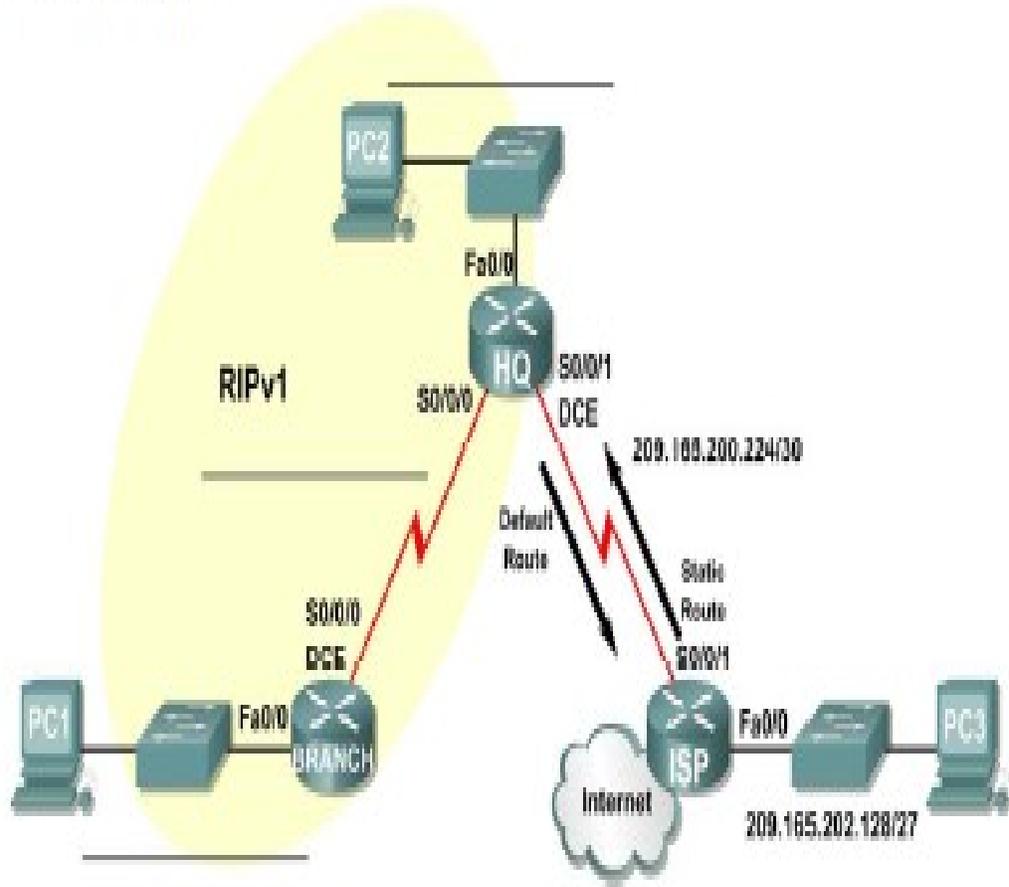
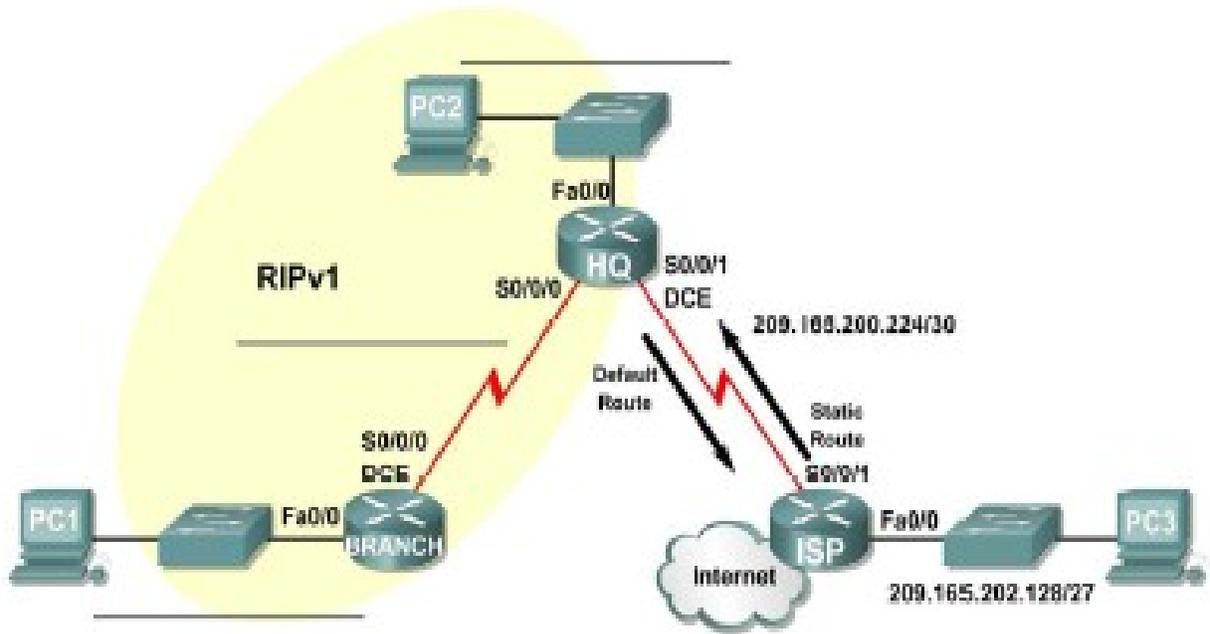## Scenario B: Running RIPv1 with Subnets and Between Classful Networks

Topology Diagram

Scenario C: Running RIPv1 on a Stub Network

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
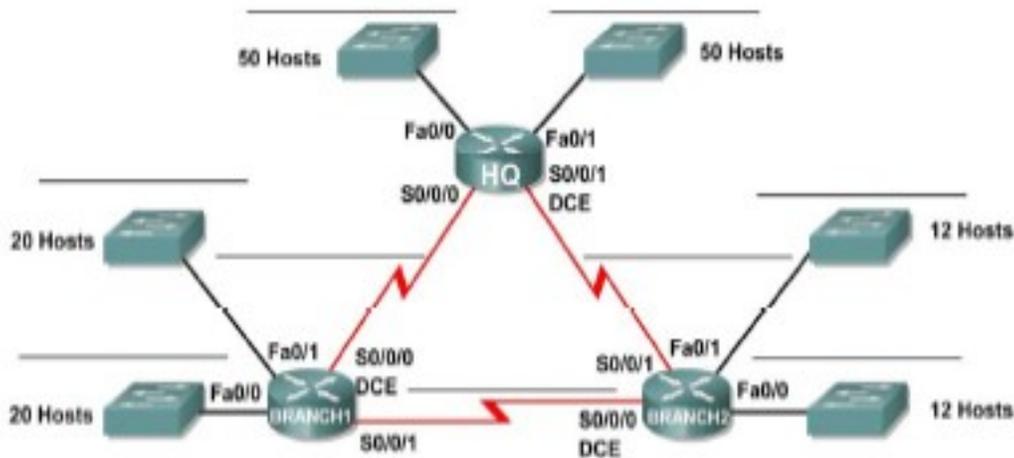
- Determine the number of subnets needed.
- Determine the number of hosts needed for each subnet
- Design an appropriate addressing scheme using VLSM.
- Assign addresses and subnet mask pairs to device interfaces.
- Examine the use of the available network address space.

12.0 Troubleshooting a VLSM Addressing Design
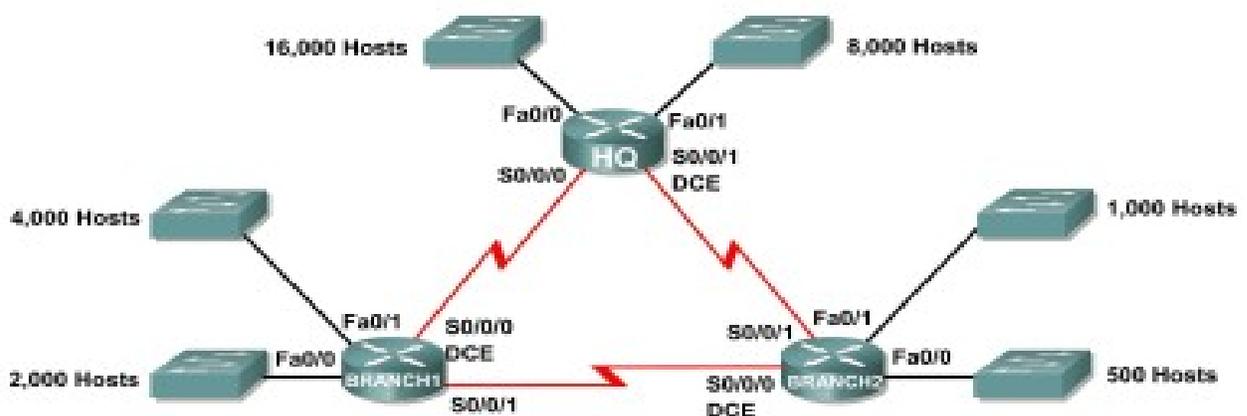
Topology Diagram

- Discover errors in a VLSM design.
- Propose solutions for VLSM design errors.

- Document the corrected VLSM assignments.

13.0 Basic Route Summarization

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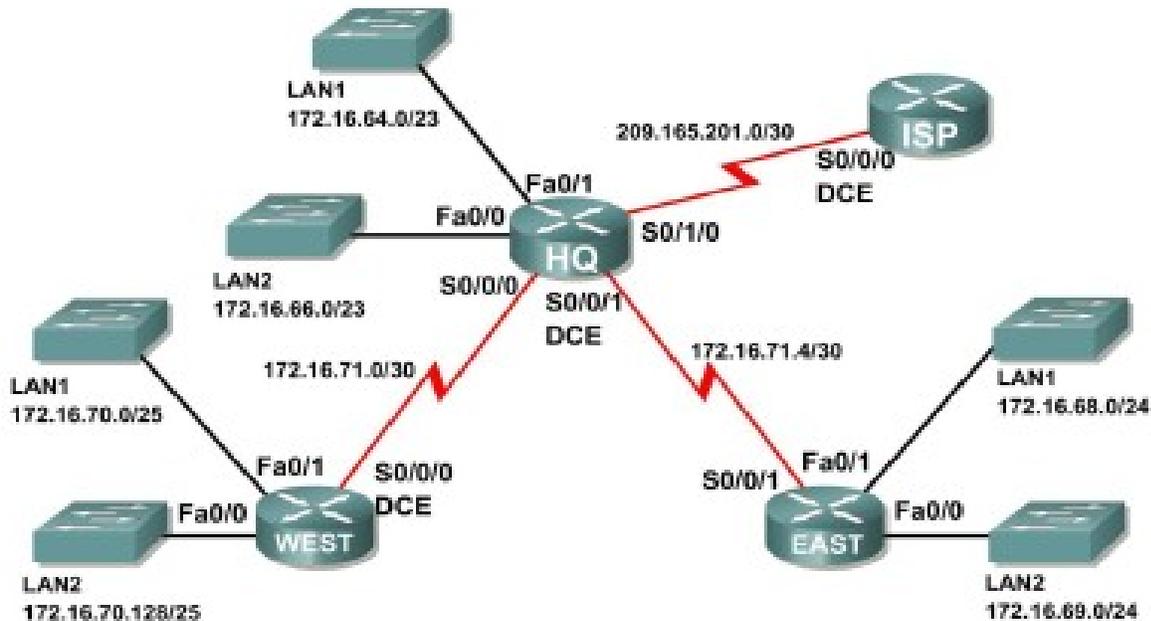
Determine summarized routes that can be used to reduce the size of routing tables

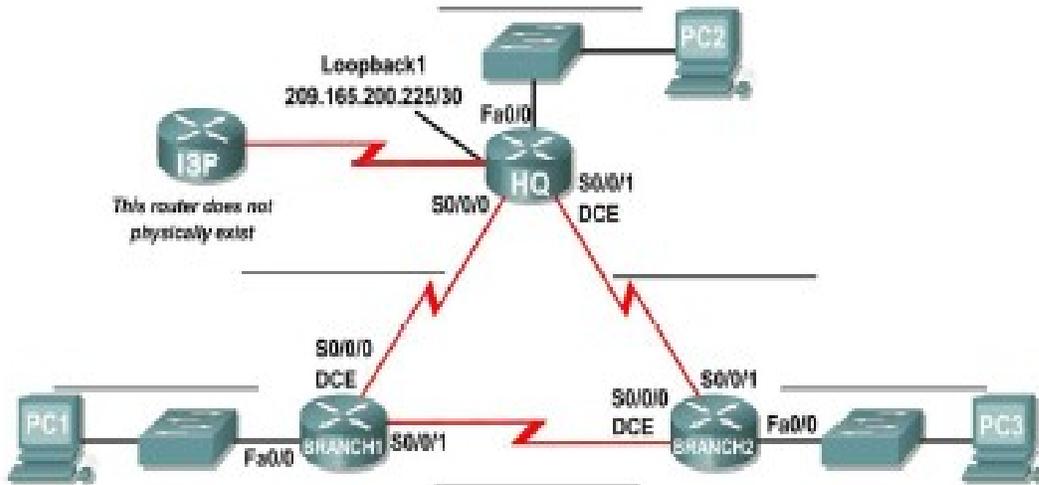## 15.0 Basic EIGRP Configuration Lab
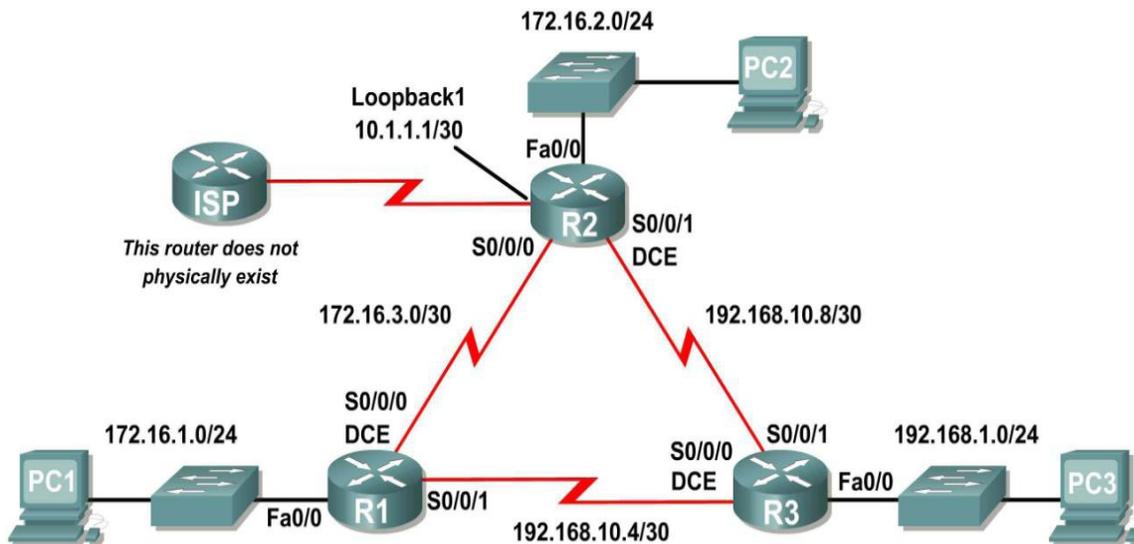
- Cable a network according to the Topology Diagram.
- Erase the startup configuration and reload a router to the default state.
- Perform basic configuration tasks on a router.
- Configure and activate interfaces.
- Configure EIGRP routing on all routers.
- Verify EIGRP routing using **show** commands.
- 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

Topology Diagram

- 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
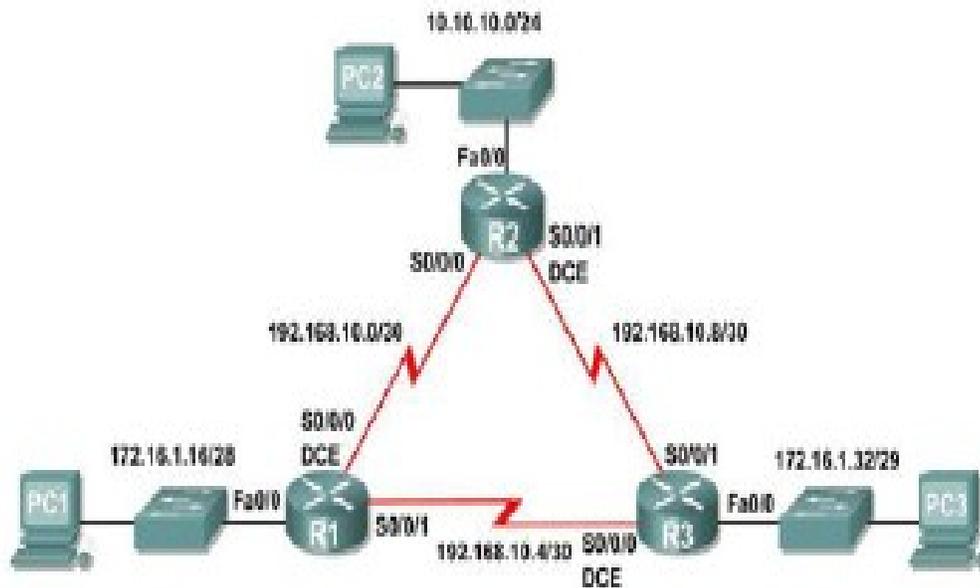
- Erase the startup configuration and reload a router to the default state
- Perform basic configuration tasks on a router
- Configure and activate interfaces
- Configure OSPF routing on all routers
- Configure OSPF router IDs
- Verify OSPF routing using show commands
- Configure a static default route
- 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
MCA 249	-	-	2	1

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
MCA 250	-	-	-	6

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

COMMUNICATION SKILLS – II

Course Code	L	T	P	Credit
BCS211	1	-	-	1

Course Objective:
To facilitate the learner with Academic Language Proficiency and make them effective users of functional language to excel in their profession.

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
BSS211	1	-	-	1

Course Objective:

This course aims at imparting an understanding of:
- Build and leverage your professional reputation
- Maintain focus in pressure situations
- Make a balanced choice between professional and personal commitments

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
FLT211	2	-	-	2

Course Objective:
To enable students:
- To develop strategies of comprehension of texts of different origin
- To present facts, projects, plans with precision

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
FLG211	2	-	-	2

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 Advanced Grammar Language and Professional Jargon

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
FLS211	2	-	-	2

Course Objective:
To enable students acquire working knowledge of the language; to give them vocabulary, grammar, voice modulations/intonations to handle everyday Spanish situations with ease.

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
FLC211	2	-	-	2

Course Objective:

How many characters are there? The early Qing dynasty dictionary included nearly 50,000 characters the vast majority of which were rare accumulated characters over the centuries. An educate person in China can probably recognize around 6000 characters. 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

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
MCA 301	2	1	-	3

Course Objective:

The primary objective of this course is to provide an introduction to the basic principles, techniques, and applications of Artificial Intelligence. The emphasis of the course is on teaching the fundamentals and not on providing a mastery of specific commercially available software tools or programming environments. Upon successful completion of the course, you will have an understanding of the basic areas of artificial intelligence search, knowledge representation, learning and their applications in design and implementation of intelligent agents for a variety of tasks in analysis, design, and problem-solving. You will also be able to design and implement key components of intelligent agents of moderate complexity in Java and/or Lisp or Prolog and evaluate their performance. Graduate students are expected to develop some familiarity with current research problems and research methods in AI by working on a research or design project.

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
MCA 302	2	1	-	3

Course Objective:

The Course gives the much needed flexibility about the latest and emerging technologies to the students like SAN, NAS, SAN- FC, iSCSI etc.

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
MCA 321	-	-	2	1

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
MCA 331	2	1	-	3

Course Objective: The course will help the students to understand the basics of search engine optimization and various techniques which can be implemented to optimizing web pages or whole sites in order to make them search engine friendly and also to improve the visibility of the web pages for different search engines.

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
MCA-332	2	1	-	3

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, OnPage 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
MCA-333	2	1	-	3

Course Objective:

This course studies the principles of programming languages with an emphasis on programming language implementation and compiler design. This includes various techniques for describing and defining a language, as well as techniques for implementing compilers. The course is centered on a large programming project-the construction of a complete compiler for a small programming language.

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
MCA-334	2	1	-	3

Course Objective:
Processing color and grayscale images or other two-dimensional signals has become an important tool for research and investigation in many areas of science and engineering. Digital Image Processing is designed to give professionals and students a powerful collection of fundamental and advanced image processing tools on the desktop. Digital Image Processing takes full advantage of the computational technology of Mathematica.

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
MCA 335	2	1	-	3

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
MCA 336	2	1	-	3

Course Objective:

The goal of CCNA Exploration LAN Switching and Wireless course is to introduce you to develop an understanding of how switches are interconnected and configured to provide network access to LAN users. This course also teaches how to integrate wireless devices into a LAN.

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
MCA337	2	1	-	3

Course Objective:

This course introduces core programming basics—including data types, control structures, algorithm development, and program design with functions—via the Python programming language. The course discusses the fundamental principles of Object-Oriented Programming, as well as in-depth data and information processing techniques. Students will solve problems, explore real-world software development challenges, and create practical and contemporary applications.

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
MCA338	2	1	-	3

Course Objective:

This course provides a basic introduction to big data and corresponding quantitative research methods. The objective of the course is to familiarize students with big data analysis as a tool for addressing substantive research questions. The course begins with a basic introduction to big data and discusses what the analysis of these data entails, as well as associated technical, conceptual and ethical challenges.

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
MCA339	2	1	-	3

Course Objectives

This course introduces mobile application development for the Android platform. Android is a software stack for mobile devices that includes an operating system, middleware and key applications. The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming language. Students will learn skills for creating and deploying Android applications, with particular emphasis on software engineering topics including software architecture, software process, usability, and deployment

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
MCA346	-	-	2	1

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
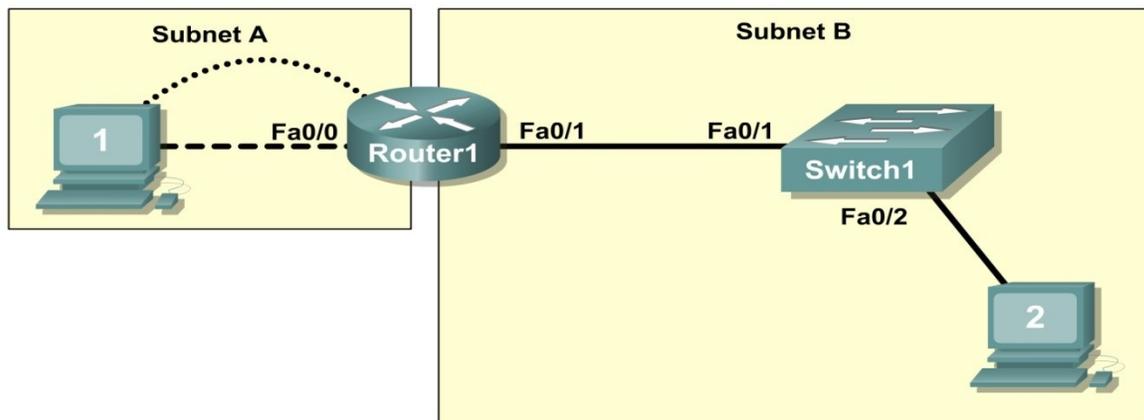
- Verify that a paper design meets stated network requirements
- Cable a network according to the topology diagram
- Erase the startup configuration and reload a router to the default state
- Load the routers with supplied scripts
- Discover where communication is not possible
- Gather information about 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– Fa0/1	172.16.31.126	255.255.255.128	N/A

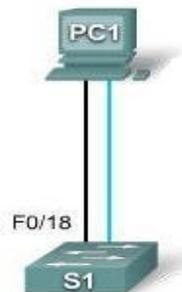**Lab III: Basic Switch Configuration**
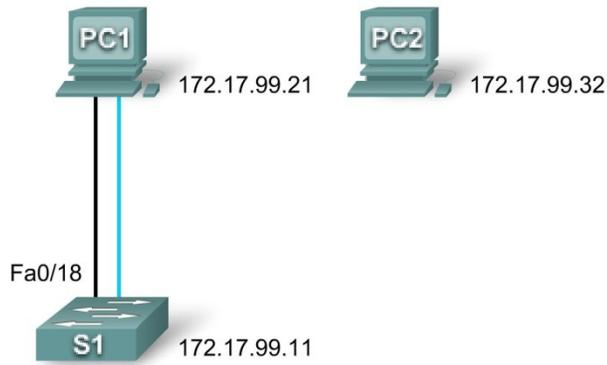
Addressing Table

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
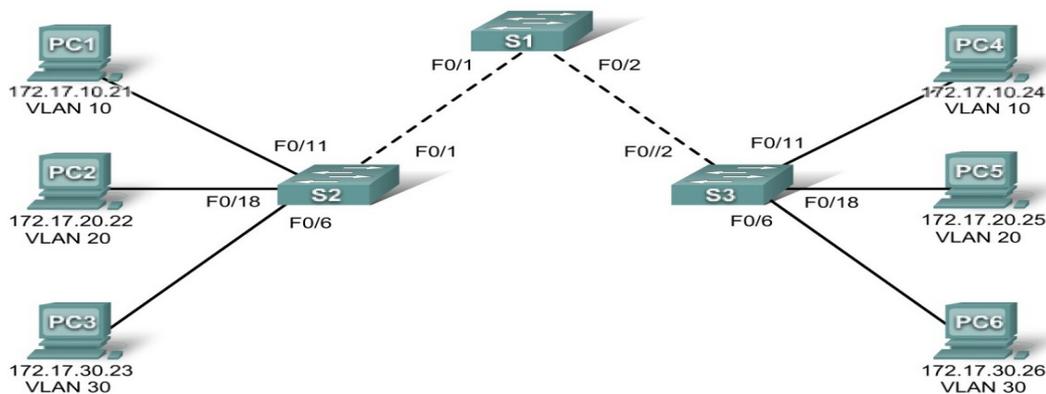
Topology Diagram

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
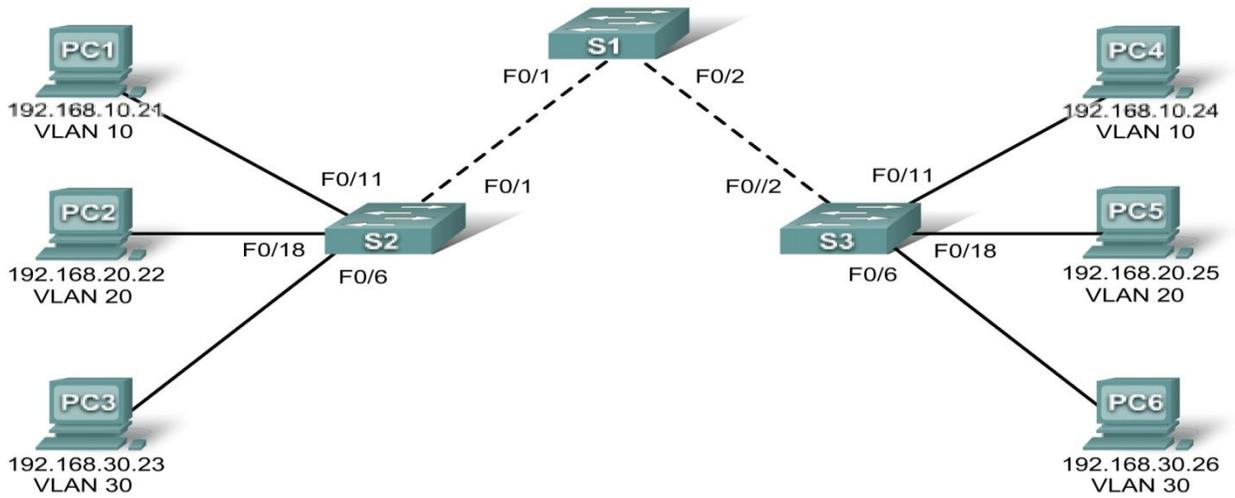
Addressing Table

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
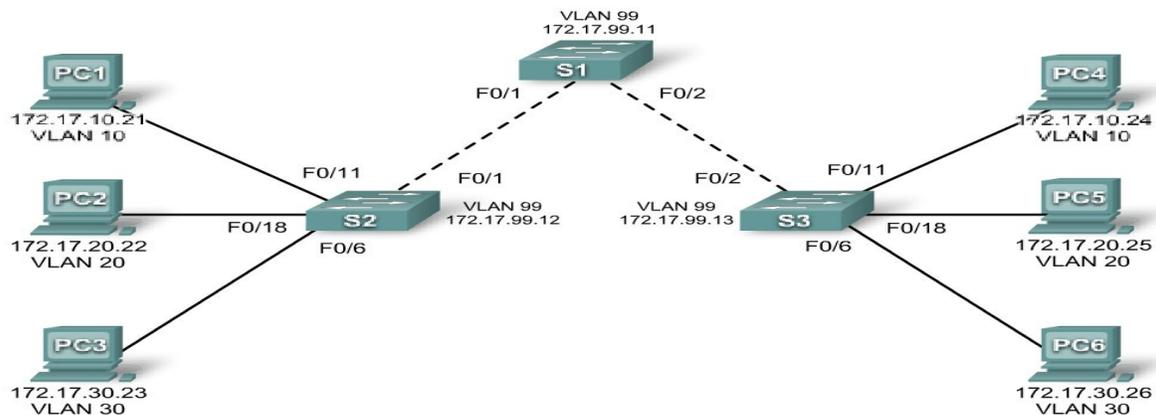**Task 3: Document the Switch Configurations**
  On each switch, capture the running configuration to a text file and save for future reference:
Task 4: Clean Up
 Erase the configurations and reload the switches. Disconnect and store the cabling. For PC hosts
 that are normally connected to other networks (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
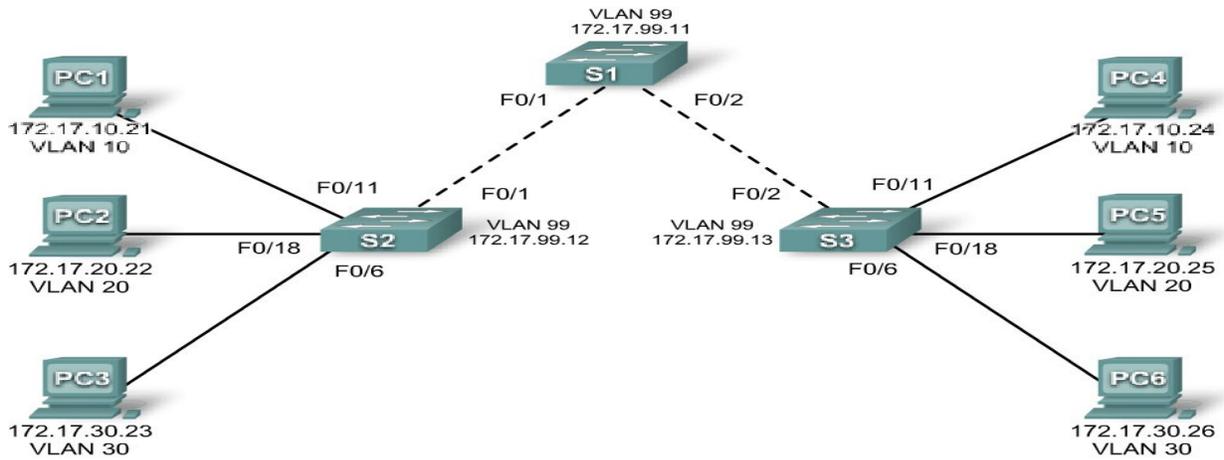
Addressing Table

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

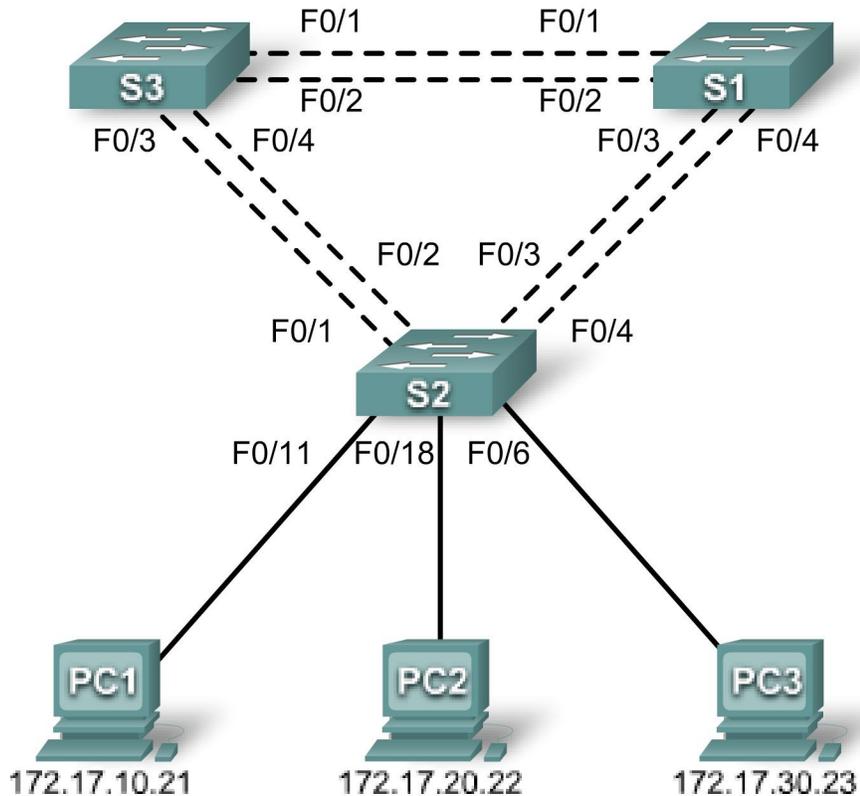**Lab IX: Basic Spanning Tree Protocol**
Topology Diagram
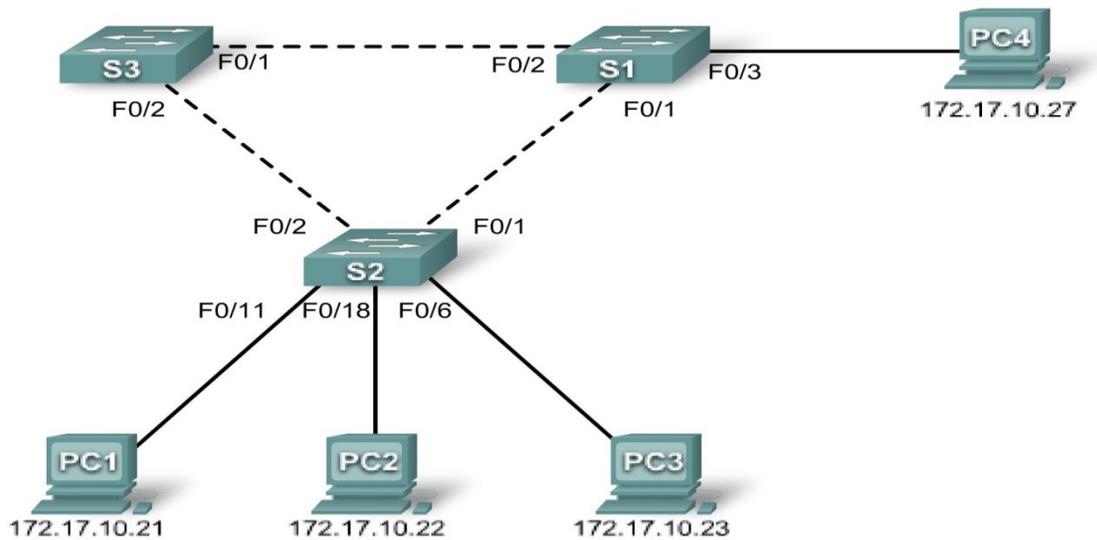
Addressing Table

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

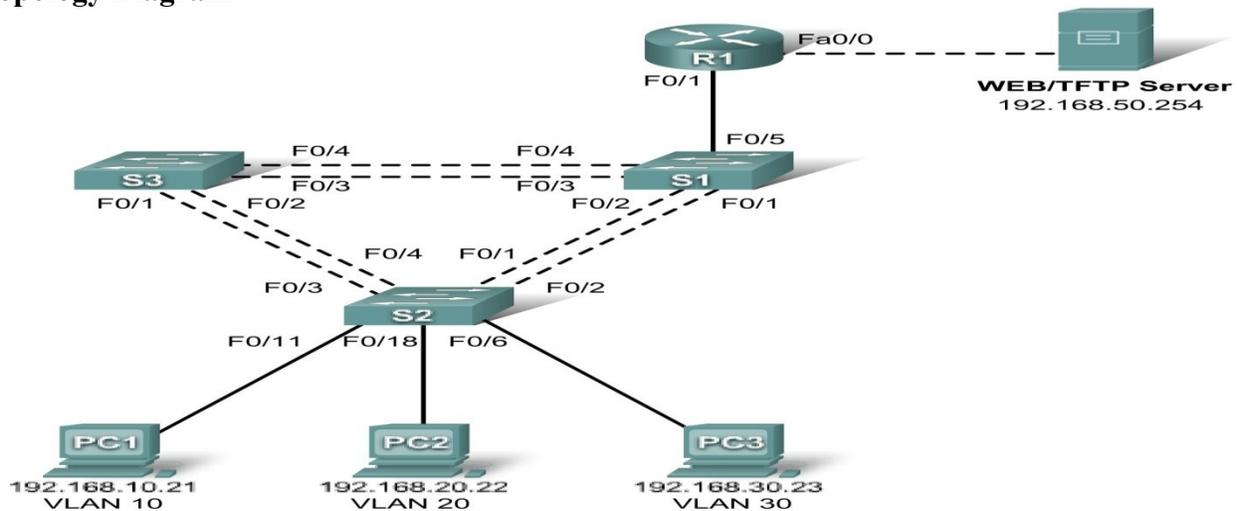| Ports	Assignment	Network
Fa0/1 – 0/4	802.1q Trunks (Native VLAN 99)	172.17.99.0 /24
Fa0/5 – 0/10	VLAN 30 – Guest (Default)	172.17.30.0 /24
Fa0/11 – 0/17	VLAN 10 – Faculty/Staff	172.17.10.0 /24
Fa0/18 – 0/24	VLAN 20 – Students	172.17.20.0 /24

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

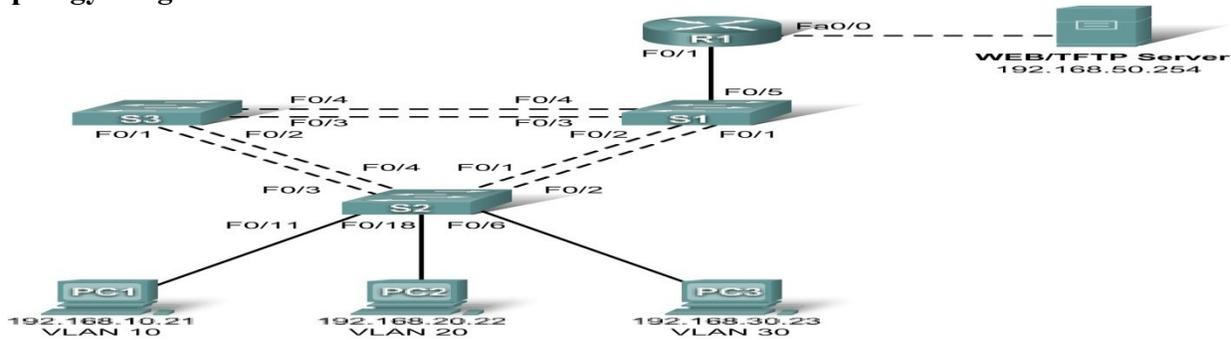| Ports	Assignment	Network
Fa0/1 – 0/5	802.1q Trunks (Native VLAN 99)	192.168.99.0 /24
Fa0/6 – 0/10	VLAN 30 – Sales	192.168.30.0 /24
Fa0/11 – 0/17	VLAN 10 – R&D	192.168.10.0 /24
Fa0/18 – 0/24	VLAN 20 – Engineering	192.168.20.0 /24

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

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

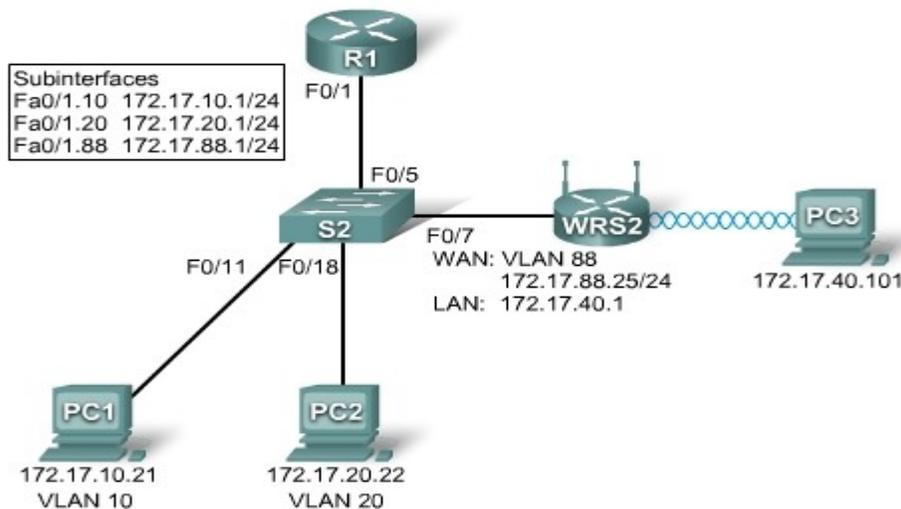**Learning Objectives**

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
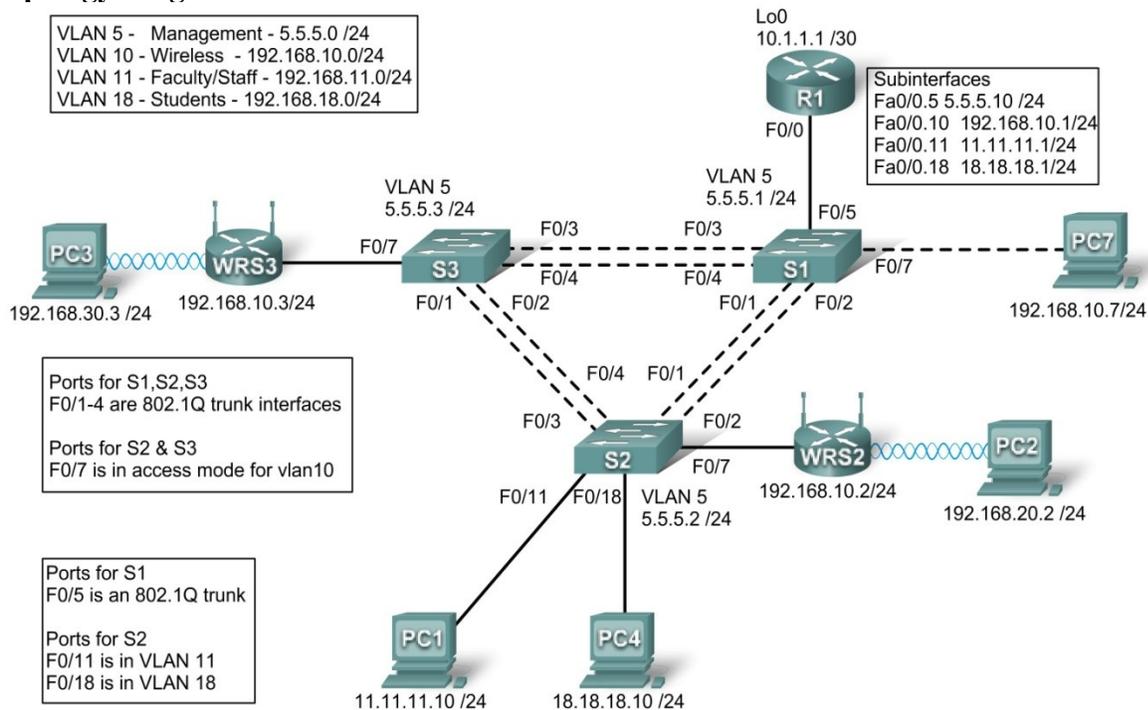
Topology Diagram

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
MCA347	-	-	2	1

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
MCA348	-	-	2	1

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
     o 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
     o 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:
          $\rightarrow$
        - 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
MCA349	-	-	2	1

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
MCA 350	-	-	-	6

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
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Front Page
Table of Contents
Acknowledgement
Student Certificate
Company Profile
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References / Bibliography

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

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

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Given by the Institute.

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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.

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- **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.

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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
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3. Interpreting research method and draw conclusion
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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
MCA 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
MCA 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

COMMUNICATION SKILLS - III

Course Code	L	T	P	Credit
BCS311	1	-	-	1

Course Objective:

The modules are designed to enhance the communicative competence of the learners to equip them with efficient interpersonal communication.

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
BSS311	1	-	-	1

Course Objective:

This course aims at enabling students towards understanding 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, understanding workforce diversity

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
FLT311	2	-	-	2

Course Objective:

To furnish some basic knowledge of French culture and civilization for understanding an authentic document and information relating to political and administrative life

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
FLG311	2	-	-	2

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 Advanced Grammar and Business Language and Professional Jargon

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
FLS 311	2	-	-	2

Course Objective:
To enable students acquire working knowledge of the language; to give them vocabulary, grammar, voice modulations/intonations to handle everyday Spanish situations with ease.

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
FLC 311	2	-	-	2

Course Objective:

What English words come from Chinese? Some of the more common English words with Chinese roots areginseng, silk, dim sum, fengshui, typhoon, yin and yang, T'al chi, kung-fu. 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.
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
MCA460/461/462	-	-	-	30

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.

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