Bachelor of Science - Information Technology

Syllabus - First Semester

DIGITAL ELECTRONICS

Course Code: IFT2112   **Credit Units: 03**

Course Objective:
An entry level course in digital electronics covering number systems, binary mathematics, digital codes, logic gates, Boolean algebra, Karnaugh maps, and combinational logic. Emphasis will be on circuit logic analysis and design of digital circuits. The student will explain the operation of digital logic gates and use Boolean algebra and Karnaugh mapping to express logic operations and minimize logic circuits in design. The student will construct, analyze combinational logic circuits & sequential circuits; create a truth table for standard digital logic gates; and add, subtract, multiply and divide using the binary numbering system. Student will also be able to understand about digital to analog conversion and vice versa.

Course Contents:

Module-I: Number System
Decimal, Binary, Octal, Hexadecimal Number Systems and Conversion of the bases, Complements: r's complement, (r-1)'s complement, Binary codes: Grey code, BCD Code, Excess-3 code
Introduction to logic systems
Positive and negative logic, Logic functions - NOT, AND, OR, NOR, EX-OR, EX NOR Truth tables Boolean algebra, De Morgan's theorems Standard forms for Logical Expressions - Sum of Products, Product of Sums Specification of Logical functions in terms of Minterms and Maxterms, Karnaugh Maps, Simplification of Logical functions, Introduction of "don't care" states.

Module-II: Combinational Building Blocks
Multiplexers, De-multiplexers, Decoders, Encoders
Arithmetic circuits
Half Adders and Full Adders, Half Subtractor and Full Subtractor

Module-III: Flip-flops
The RS latch, the clocked RS flip-flop, JK Flip Flop, the Master-Slave JK flip-flop, Delay and Toggle flip-flops
Flip-flops in counter circuits
Asynchronous (ripple) Counters (UP/DOWN), Synchronous Counter design (UP/DOWN), Non Sequential Counting

Module-IV: Shift Registers
Shift registers in general, Ring Counters, Johnson Counter
Introduction to Memory
Primary: RAM, Static RAM, Dynamic RAM, ROM, PROM, EAPROM, Secondary: Floppy Disk, Hard Disk, CDROM

Module-V: Introduction to Logic Families, DACs and ADCs
Introduction to logic families-TTL, RTL,ECL,CMOS,DTL,IIL
Binary weighted resistor DAC, Resolution, linearity and settling time of DACs, Successive approximation ADC

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text & References:

Text:
- R.P Jain, Mordern Digital Electronics, Tata Mcgraw Hill.

References:
- Malvino& Leach, Digital Electronics, Tata Mcgraw Hill,2006,Edition 6.
- Floyd, Digital Fundamentals,Pearson,2015.
- M.M Mano, Digital Logic and Computer Design,Pearson.

COMPUTER PROGRAMMING WITH C LANGUAGE

Course Code: IFT2116   **Credit Units: 03**

Course Objective:
The primary objective of this course is to understand all the components of C, including the C language, the C Preprocessor, and the C Standard Library. An understanding of some advanced practical issues, including memory management, testing and debugging, complex declarations and expression evaluation, building and using libraries, and evaluating tradeoffs, such as size vs. speed and speed vs. complexity. The ability to write C code and create and manipulate linked lists.

Course Contents:
Module-I: Introduction to 'C' Language
History of C, Introduction of C, Basic structure of C program, Concept of variables, constants and data types in C, Operators and expressions: Introduction, arithmetic, relational, Logical, Assignment, Increment and decrement operator, Conditional, bitwise operators, Expressions, Operator precedence and associatively. Managing Input and output Operation, formatting I/O.

Module-II: Decision making and looping
Decision making in program, Relational Logical operators example, if statements, if -else, nested if-else statements, Switch, case loop, Do-While, While, for loop and nesting of loop, continue and break Storage types , predefined processor.

Module-III: Arrays and Functions
One Dimensional Arrays, Arrays Manipulation, Sorting, Searching, Function declaration, example& calling a function. Passing Arguments, call by value and call by references, Recursive function, .Recursion.

Module-IV: Pointers and String
Pointers: Declaration, Pointer assignments, initialization, Pointers and Dynamic Memory Allocation, Array of Pointers, strings, string handler functions.

Module-V: Structure Union & file handling
Structure definition, Declaration, structure Assignments, Arrays in structure, Structure Arrays, Pointer Structure, Nested Structure, Arrays of Structure, Union declaration, assignments & example programs, Difference between structure & union, file handling and the related functions.

Examination Scheme:

Components	CT1	A/C/Q	ATTD.	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
* Problem Solving through C language, E. Balagurusamy, TMH publication.
* Peter Nortons, "Introduction to Computers", TMH publication.

References:
* Peter Nortons, "DOS Guide", Prentice Hall
* Gottfried, "Programming in C", Schaum, Tata McGraw Hill
* Y. Kanetkar, "Let us C", BPB Publications
* Y. Kanetkar, "Understanding Pointers", BPB Publications
* Schidlt, "The Complete Reference of C", Tata McGraw Hill

COMPUTER FUNDAMENTALS & TOOLS LAB

Course Code: IFT2115   **Credit Units: 01**

1. Create a new folder and do the following:
   1. Make a word document in it.
   2. Make an Excel document in it.
   3. Make a new folder in it
   4. Rename the initial folder
   5. Move the initial folder
   6. Copy the initial folder.
   7. Delete the initial folder
2. Implement the various well known features of Windows operating system such as Notepad, WordPad, Paint, System tools, Entertainment etc. enclosed in Start→Programs→Accessories.
3. Implement various display properties by right clicking on the Windows Desktop.
4. Explore the taskbar of Windows.
5. Set the wall paper and screen saver.
6. Set the date/time.

MS-Word
1. Create a document and
   a. Put Bullets and Numbers
   b. Apply various Font parameters.
   c. Apply Left, Right, and Centre alignments.
   d. Apply hyperlinks
   e. Insert pictures
   f. Insert ClipArt
   g. Show the use of WordArt
   h. Add Borders and Shading
   i. Show the use of Find and Replace.
   j. Apply header/footers
2. Create any document and show the use of File→versions.
3. Create any document and show the difference between paste and paste special.
4. Create a document to show the use of Washout/Watermark.
5. Implement the concept of mail merge.
6. Implement the concept of macros.
7. Implement the concept of importing a file/document.
8. Implement the concept of merging the documents.
9. Crate a student table and do the following:
   a. Insert new row and fill data
   b. Delete any existing row
   c. Resize rows and columns
   d. Apply border and shading
   e. Apply merging/splitting of cells
   f. Apply sort
   g. Apply various arithmetic and logical formulas.
10. Create your resume using General Templates.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

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

COMPUTER PROGRAMMING WITH C LANGUAGE LAB

Course Code: IFT2118   **Credit Units: 01**

1. Write a program to swap 2 no .
2. Write a program to demonstrate Greatest of 3 nos and to print the given no in ascending order.
3. Write a program to perform the arithmetic expression using switch statement.
4. Write a program to find factorial of given no using do while statement.
5. Write a program to print prime up to n no.
6. Write a program to sum of n natural no.
7. Write a program to print the product of two matrices of any order.
8. Write a program to print Fibonacci series.
9. Write a program to print the following pattern using for loop
   1
   2 2
   3 3 3
   4 4 4 4
10. Write a program to read nnum of students and 5 subjects marks.
11. Write a program to find factorial of a num using 3 types of functions.
12. Write a program to convert all lower case to uppercase characters
13. Write a program to find the factorial of a number using recursion
14. WAP program to print the element of array using pointers.
15. WAP program to implement call by reference.
16. WAP program to find greatest of 'n' num using function.
17. WAP to Create , initialize and access the elements of a structure.
18. WAP program to print the elements of a structure using pointers
19. WAP program to display student information by initializing structures
20. WAP program to find total number of marks.
21. WAP program to find the total salary of employee and employee details using structure.
22. Program to write data into file and read data from file.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

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

Syllabus - Second Semester

DISCRETE MATHEMATICS STRUCTURES WITH APPLICATIONS TO CS

CourseCode:IFT2222   **Credit Units: 03**

Course Objective:
The Objective of this course is to provide the fundamentals and the concepts of Discrete Mathematical Structures with Applications to Computer Sciences including Mathematical Logic, Boolean Algebra and its Applications, Switching circuit & Logic Gates, Graphs and Trees. Important theorems with constructive proofs, real life problems & graph theoretic algorithms to be covered with an aim of helping the students to understand the computational and algorithmic aspects of Mathematical Logic, Boolean Algebra, Graphs and Trees in the field of Computer sciences and its applications.

Course Contents:
Module I: Introduction
Permutation and Combination : Counting Techniques.
Relation: Type and compositions of relations, Pictorial representation of relations, closures of relations, Composite Relations, Equivalence relations.
Function: Types, Composition of function, Mathematical Induction, Discrete Numeric Function and Generating Functions

Module II:Mathematical Logic
Proposition, Propositional Calculus- Propositional Variables and Compound Propositions, Basic Logical Operations: -Conjunction, Disjunction, Negation, Conditional, Bi conditional. Compound Statements, Equivalence, Duality, Algebra of Statements, Valid and Invalid, Arguments, Tautologies, Contradiction, Contingency , Boolean Functions – Disjunctive Normal Form, Conjunctive Normal Form.
Duality Principle.

Module III: Graphs
Basic Terminology of Graphs , Handshaking Lemma , Sub graphs, and Union of Graphs , Connected graph, Disconnected graph, Null graph, Incidence matrix, Adjacency matrix, Degree of a graph, Directed Graph, Walk, Path, Circuit, Wheel, Eulerian graph, Hamiltonian graph, Planar graph , Kuratowski's graphs-I and II , Coloring , Bipartitie Graph , Cyclic Graph.

Module IV: Trees
Tree, Properties of Tree, Spanning Tree, Fundamental Circuit, Cut-Set, Cut-Vertices. Binary Tree , Rooted Trees, Path length, Minimum Spanning Trees, Huffman Encoding.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
- Kenneth H. Rosen, "Discrete Mathematics and its applications", TMH
- Elements of Discrete Mathematics: C.L. Liu,TMH, Edition 4.
- Graph Theory with Applications to Engineering and Computer Science: N. Deo

References:
- Discrete Mathematics: Harikishan&ShivrajPundir,Pragati'sPrakashans.

WEB TECHNOLOGIES

Course Code:IFT2217   **CreditUnits: 03**

Course Objective:
This course is aimed to provide a fundamental understanding of web site creation. HTML is the language used for designing most basic web pages. Syllabus includes basic and advanced features of HTML.It also give an overview of XML and CSS.

Course Contents:
Module-I: Introduction to HTML
History of HTML, Structure of HTML, HTML Basic: Elements, Tags and Attributes. Adding Comments, Adding Title, HTML Background: using plain color, using image, Formatting Text : Paragraph, inserting line break, Heading Style, Bold text, Italicized text, Underlined text, Teletype text, Strikeout, Superscript, Subscript, Important text, Emphasized text, Inserted text, Deleted text, Larger text, Smaller text. Working with Text: Changing font Sizes and Colors.
Creating List: Ordered List, Unordered List, Definition List, Nested List. Inserting image, Creating Hyper Text Links, Creating Image Links, Horizontal Rules, Marquee Tag. Address Tag.

Module-II: Table & Frames
Tables: Creating Tables, Table Element, Adding Border, Adding Column Headings, Cellspacing and Cellpadding, Adding a Caption, Setting the table Width and Height, Add Row Headings, Aligning Cell contents, Setting Column Width, Centering a Table, Inserting Image, Rowspan, Colspan, Assigning Background Colors.
Frames: Frameset Element, Frame Element, Noframes Element, Specifying Target,Inline Frames.

Module-III: Forms and validation
Forms: Introduction to Forms, Form Elements, Text Field, Password Field, Label, Check Box, Radio Button, Selection List, Text Area, Button.
Front level validations using JavaScript: Checking a Non-empty Text/Password Field, Restricting Length of Text/Password Field.

Module-IV: Cascading Style Sheets
Overview of style sheets, Advantages, Different ways to use style sheet: External style sheet, Internal style sheet, Inline style sheet.
Selectors: Element selector, Id selector, Class selector, Grouping selector. Adding style to a Document, Adding Comments in CSS.

Module-V: XML
Introduction to XML, XML Basics, XML Structure, XML Tags, XML Elements, XML Attributes, Adding Comments, XML Document Type Declaration: Internal DTD and External DTD. Well formed XML Documents and Valid XML Documents.

Examination Scheme:

Components	CT	A/C/Q A/C/Q	Attd.	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
- HTML, DHTML, JavaScript, Perl, CGI, Ivan Bayross, BPB Publication.
- Web Technologies,Uttam.K.Roy,Oxford University Press.

References:
- HTML Complete Reference, BPB Publication.

DATA STRUCTURES THROUGH 'C' LANGUAGE

Course Code: IFT2211   **Credit Units: 03**

Course Objective:
This course is an introduction to the use, design, and analysis of data structures in computer programs. The very commonly used data structures like arrays, stacks, queues, lists, trees, and graphs will be discussed in detail. Sorting and hashing are important topics in the study of algorithms. They are also closely related to the design of data structures. Several algorithms to implement these techniques are included in the syllabus.

Course Contents:
Module I: Basic concepts and Array
Definition Accessing the address of a variable, Declaring and initializing pointers. Accessing a variable through its pointer. Meaning of static and dynamic memory allocation. Memory allocation functions :malloc, calloc, free and realloc.
Representation of arrays single and multi dimensional arrays. Address calculation using column and rows major ordering. Various operations on arrays, Application of arrays: matrix multi multiplication.

Module II: Stacks and Queues
Definition, Array representation of stack.Operations on stack: Infix, prefix and postfix notations.Conversion of an arithmetic expression from Infix to postfix. Evaluation of postfix expression using stacks.
 Definition, Array representation of Queue. Types of queue: Simple queue, circular queue, double ended queue (deque), priority queue, operations on all types of Queues.

Module III: Linked List
 Definition, Components of linked list, Representation of linked list, Advantages and Disadvantages of linked list. Types of linked list : Singly linked list, Doubly linked list, Circular linked list and circular doubly linked list. Operations on singly linked list : creation, insertion, deletion, search and display (based on the different position as specified by the user).Linked representation of Stacks & Queues.

Module IV: Trees
 Definition : Tree, Binary tree, Complete binary tree, Binary search tree, Heap Tree terminology : Root, Node, Degree of a node and tree, Terminal nodes, Non terminal nodes, Siblings, Level, Edge, Path, depth, Parent node, ancestors of a node. Binary tree : Array representation of tree, Creation of binary tree. Traversal of Binary Tree: Preorder, Inorder and post order. Representation of trees and its application, Binary search tree: Insertion & deletion in BST. Height balanced (AVL) tree

Module V: Searching, sorting and complexity
Searching: Sequential and binary search, Comparison between linear and binary search. Sorting: insertion, selection, bubble, quick, merge, heap sort.

Module VI: Graphs
Graph representation: adjacency list, adjacency matrix. Types of Graphs:Directed& Undirected Graph .Traversal scheme: Depth first search, Breadth first search. Spanning tree: definition, minimal spanning tree algorithms.

Examination Scheme:

Components	CT1	A/C/Q	ATTD.	EE
Weightage (%)	15	10	5	70

Text & References:

Text:
- Brian W. Kernighan, Dennis M. Ritchie"The C Programming Language",Prentice Hall.
- T. Langsam, M.J Augenstein and A.M. Tanenbaum, "Data structure using C and C++ Second edition, 2000, Prentice hall of India.
- R. Kruse, G.L. Tonodo and B. Leung," Data structures and progam design in C", Second Edition, 1997, Pearson education.
- S. Chottopadhayay, D. Ghoshdastidar& M. Chottopadhayay. Data structures through language", First edition, 2001, BPB Publication.

References:
- G.L. Heileman, Data structures, Algorithms and object oriented programming," First Edition 2002, Tata McGraw Hill.
- E. Horowitz, Sahni and D. Mehta," Fundamentals of data structures in C++,"2000 Galgotia Publication

INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS

Course Code: IFT2202   **Credit Units: 03**

Course Objective:
The objective of this course is to expose the students to the fundamentals & basic concepts in Data Base Management Systems. This course discusses architecture of Database Systems with concept of relational model & ER model. This course explains   techniques for database design, Normalization and database recovery and protection.

Course Contents:
Module I: Introduction to DBMS
Definition of DBMS, Characteristics and Application of Database, Data Independence, DBMS Architecture, Levels, Database Administrator, File System Approach Vs DBMS Approach, Advantages of Using a DBMS, Data Models, Schemas, and Instances, Classification of DBMS.

Module II: Relational Database & ER Model
Relational System, Codd's Rule, Relational Model, Optimization, Tables and Views, Entity, Types of Entity, Weak Entity Attributes, Entity sets , Entity – Relationship Diagrams, Overview of Enhanced-Entity Relationship (EER) Model.

Module III: Relational Model Objects
Domains and Relations, Relations and predicates, Relational Data Integrity; Primary Key, Candidate Key , Foreign Key and their rules; Relational operators, Relational Algebra, Relational Calculus, SQL Language: Schema Definition, Constraints, Queries and Views.

Module IV: Database Design
Definition of Functional Dependencies, Process Of Normalization, First Normal Form, Second Normal Form, Third Normal Form. BoyceeCodd Normal Form, Fourth Normal Form, Fifth Normal Form, Database design and implementation process.

Module V: Data Recovery & Protection
Introduction to Transaction Processing, Types of Failure, Database Recovery techniques: Based on Deferred Update, based on Immediate Update, Shadow Paging. Concurrency Control Techniques: Two-Phase Locking technique, Timestamp Ordering, Multiversion Technique.
Introduction to Database Security, Data Security Requirements, Protecting data within database.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
- Fundamental of Database Systems, Elmasri&Navathe, Pearson Education, Asia
- Database System Concepts, Korth&Sudarshan, TMH

References:
- Raghurama Krishnan: Data base Management Systems, Johannes Gehrke, TataMcGrawHill Latest Edition.
- C.J.Date: Introduction to Database Systems, Pearson Education.
- Data Base Management System, Leon & Leon, Vikas Publications
- Introduction to Database Systems, Bipin C Desai, Galgotia
- Oracle 9i The Complete Reference, Oracle Press

COMPUTER ORGANISATION AND ARCHITECTURE

Course Code: IFT2219   **Credit Units: 03**

Course Objective:
The student will develop an understanding of the underlying operation of a modern digital computer, identify and understand the various "building blocks" from which a modern computer is constructed. The student will learn to develop simple assembly language programs and understand the underlying operations of more complex programs using Intel's 8085 Microprocessor.

Course Contents:

Module I: General Computer Architecture
Block Diagram of typical Computer, Memory Section, Input/Output Section, CPU, Registers, Arithmetic Unit, Instruction handling Areas, Stacks

Register Transfer Language and Micro operations: Register Transfer, Bus and Memory Transfer, Arithmetic Micro operations(Binary Adder, Binary Adder-subtractor, Binary incrementer, Arithmetic Circuit), Logic Micro operations, Shift Micro operations, Arithmetic Logic Shit Unit

Module II: Basic Computer Organization and Design
Instruction Codes,stored program organization computer registers, common bus system, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input Output Instructions and Interrupts

Module III: Central Processing Unit
General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, RISC, CISC
Pipelining and Vector Processing: Parallel Processing, Pipelining(General considerations), Arithmetic Pipeline, Instruction Pipeline, Vector Processing, Array Processors

Module IV: Input Output Organization
I/O Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA, IOP, Serial Communication
Memory Organization: Associative Memory(Hardware organization, Match logic), Cache Memory(associative mapping, Direct Mapping, Set Associative Mapping), Virtual Memory

Module V: Introduction to Microprocessor
Machine Language, Assembly Language, Assembler, High Level Language, Compiler, Interpreter, Internal Architecture 8085.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
• Computer System Architecture, M.M. Mano, Pearson Education.
References:
• Computer Architecture and Organization, J.P Hayes, TMH.
• Hayes Computer Architecture and Organization, TMH Publisher.

DATA STRUCTURES THROUGH 'C' LANGUAGE LAB

Course Code: IFT2216   **Credit Units: 01**

Course Contents:

1. Write a program to perform the following operations on two given matrices: Addition and Multiplication
2. Write a program to insert & delete an element from the kth element of an array
3. Write a program to search an element in a given array using linear search.
4. Write a program to search an element in a given array using binary search.
5. Write a program to sort the elements of an array using Bubble Sort.
6. Write a program to sort the elements of an array using Selection Sort.
7. Write a program to sort the elements of an array using Insertion Sort.
8. Write a program using the concept of iteration and recursion to sort the elements of an array using Quick Sort.
9. Write a program to implement a Stack, show overflow and underflow while performing push and pop operations respectively.
10. Write a program to implement a queue and show the following: insertion and deletion
11. Write a program to implement Linear Linked List and show the following operations: creation, display, insertion, deletion and searching.
12. Write a program to implement Doubly Linked List and show the following operations: creation, display, insertion, deletion and searching.
13. Write a program to construct a Binary Search tree and perform the following operations: Insertion and Deletion of a node.
14. Write a program to implement Depth First Search using linked representation of graph.
15. Write a program to implement Breadth First Search using linked representation of graph.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

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

WEB TECHNOLOGIES LAB

Course Code: IFT2220   **CreditUnits: 01**

Course Contents:
1   Design a webpage to show a basic structure of html document using tags like head, title and body.
2   Design a webpage to show various tags used for formatting text.
3   Design a webpage to show usage of various heading tags, font tag and background color.
4   Design a webpage to insert image in the background.
5   Design a webpage to insert image with alignment.
6   Design a webpage to show the use of link(Text & Image).
7   Design a webpage to show scrolling text and scrolling image using marquee tag.
8   Design a webpage to show usage of ordered list.
9   Design a webpage to show usage of unordered list.
10 Design a webpage to show usage of definition list.
11 Design a webpage to show usage of nested list.
12 Design a table with 5 rows and 5 columns.
13 Design a table using rowspan, colspan, cell padding and cell spacing.
14 Divide a webpage into 3 blocks using frame tag(row wise) .
15 Divide a webpage into 3 blocks using frame tag(column wise) .
16 Design a log-in form to show various elements of form.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

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

INTRODUCTION TO DATABASE MANAGEMENT SYSTEM LAB

Course Code: IFT2223   **Credit Units: 01**

1. Given the table STUDENT:

Student No.	Class	Name	GAME	Grade1	SUPW	Grade2
10	7	Sameer	Cricket	B	Photography	A
11	8	Sujit	Tennis	A	Gardening	C
12	7	Kamal	Swimming	B	Photography	B
13	7	Veena	Tennis	C	Cooking	A
14	9	Archana	Basket Ball	A	Literature	A
15	10	Arpit	Cricket	A	Gardening	C

(i)   Display the names of the students who are getting a grade C in either GAME or SUPW.
(ii)   Display the number of students getting grade A in cricket.
(iii)   Display the different games offered in the school.
(iv)   Display the SUPW taken by the students, whose name starts with 'A'.
(v)   Add a new column named 'Marks'.
(vi)   Assign a value 200 for Marks for all those who are getting grade B or above in GAME.
(vii)   Arrange the whole table in the alphabetical order to SUPW.

2. Given the table SPORTS:

Student No.	Class	Name	GAME1	Grade1	GAME2	Grade2
10	7	Sameer	Cricket	B	Swimming	A
11	8	Sujit	Tennis	A	Skating	C
12	7	Kamal	Swimming	B	Football	B
13	7	Veena	Tennis	C	Tennis	A
14	9	Archana	Basket Ball	A	Cricket	A
15	10	Arpit	Cricket	A	Athletics	C

(i)   Display the names of the students who are getting a grade C in either GAME1 or GAME2.
(ii)   Display the number of students getting grade A in cricket.
(iii)   Display the names of the students who have same game for both GAME1 and GAME2.
(iv)   Display the games taken by the students, whose name starts with 'A'.
(v)   Add a new column named 'Marks'.
(vi)   Assign a value 200 for Marks for all those who are getting grade B or above in GAME.
(vii)   Arrange the whole table in the alphabetical order of Name.

3. Given the table STUDENT:

Student No.	Name	Stipend	Stream	AvgMarks	Grade	Class
1	Karan	400.00	Medical	78.5	B	12B
2	Divakar	450.00	Commerce	89.2	A	11C
3	Divya	300.00	Commerce	68.6	C	12C
4	Arun	350.00	Humanities	73.1	B	12C
5	Sabina	500.00	Nonmedical	90.6	A	11A
6	John	400.00	Medical	75.4	B	12B
7	Robert	250.00	Humaities	64.4	C	11A

8	Rubina	450.00	Nonmedical	88.5	A	12A
9	Vikas	500.00	Nonmedical	92.0	A	12A
10	Mohan	300.00	Commerce	67.5	C	12C

(i)   Select all the Nonmedical stream students from STUDENT.
(ii)   List the names of those students who are in class 12 sorted by Stipend.
(iii) List all students sorted by AvgMarks in descending order.
(iv)   Display a report listing Name, Stipend, Stream, and amount of Stipend received in a year assuming that the stipend is paid every month.
(v)   Count the number of students with Grade 'A'.
(vi)   Insert a new student in the STUDENT table and fill all the columns with some values.
(vii) Give the output of the following SQL statements:
    (a) Select MIN(AvgMarks) from STUDENT where AvgMarks> 75;
    (b) Select SUM(Stipend) from STUDENT where Grade = 'B';
    (c) Select AVG(Stipend) from STUDENT where Class = '12A';
    (d) Select COUNT(DISTINCT);

4. Write SQL statement to create EMPLOYEE relation which contain EmpNo, Name, Skill, PayRate.

5. Create a table with the under-mentioned structure (Table name is Emp)
```
EmpNo          NUMBER(4)
DeptNo         NUMBER(2)
EmpName        CHAR(10)
Job            CHAR(10)
Manager        NUMBER(4)
HireDate       DATE
Salary         NUMBER(7, 2)
Commission     NUMBER (7, 2)
```

6. Find out the number of employees having manager as job.

7. Display only the jobs with maximum salary greater than or equal to 3000.

8. Find all those employees whose job does not start with 'M'.

9. List the minimum and maximum salary of each job type.

10. Find all the employees who have no manager.

11. Create a table with the under-mentioned structure (Table name is Dept)
```
DeptNo         NUMBER(2)
DeptName       CHAR(12)
Location       CHAR(12)
```

12. Create a table with the under-mentioned structure (Table name is PROJECT)
```
ProjId         NUMBER(4)
ProjDesig      CHAR(20)
ProjStartDT    DATE
ProjEndDT      DATE
BudgetAmount   NUMBER(7)
MaxNoStaff     NUMBER(2)
```

13. Create a table with the under-mentioned structure (Table name is SalGrade)
```
LowSal         NUMBER(7, 2)
```

HighSal   NUMBER(7, 2)
Grade   NUMBER(2)

Where LowSal is the lowest salary limit in the grade and HighSal is the highest salary limit in the grade.

14. Write SQL statements to list all employees in the following format:
EMPLOYEE WORKS IN DEPARTMENT Dept. No
SMITH WORKS IN DEPARTMENT   20
SUDHIR WORKS IN DEPARTMENT   20
RAJWORKS IN DEPARTMENT   10
SMITHS WORKS IN DEPARTMENT   30
SANTOSH WORKS IN DEPARTMENT   30

15. Given the table MOV:

No.	Title	Type	Rating	Stars	Qty	Price
1	Gone with the Wind	Drama	G	Gable	4	39.95
2	Friday the 13th	Horror	R	Jason	2	69.95
3	Top Gun	Drama	PG	Cruise	7	49.95
4	Splash	Comedy	PG13	Hanks	3	29.95
5	Independence Day	Drama	R	Turner	3	19.95
6	Risky Business	Comedy	R	Cruise	2	44.95
7	Cocoon	Scifi	PG	Ameche	2	31.95
8	Crocodile Dundee	Comedy	PG13	Harris	2	69.95
9	101 Dalmations	Comedy	G		3	59.95
10	Tootsie	Comedy	PG	Hoffman	1	29.95

Find the total value of the movie cassettes available I the library.
Display a list of all movies with Price over 20 and sorted by Price.
Display all the movies sorted by Qty in descending order.
Display a report listing a movie number, current value and replacement value for each movie in the above table. Calculate the replacement value for all movies as Qty * Price * 1.15.
Count the number of movies where rating is not 'G'.
Insert a new movie in the MOV table. Fill all the columns with some values.
Give the output of the following SQL statements:
Select AVG (Price) from MOV where Price < 30;
Select MAX (Price) from MOV where Price > 30;
Select SUM (Price * Qty) from MOV where Qty< 4;
Select COUNT (DISTINCT);

16. Write a PL/SQL program for:

a) Printing the Fibonacci series from 1 to 50.
b) Printing the smallest number among any three numbers.
c) Printing the table of any specific number entered.

17. Create a trigger named "Client_Master" which keeps track of records deleted or updated when such operations are carried out. Records in this table are inserted into table "Audit" when database trigger fires due to an update or delete statement fired on this table "Client".

Table: Client

Column name	Data type	Size
Client_no	Varchar2	6
Name	Varchar2	20
Address	Varchar2	30
Balance_Due	Number	10,2

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

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

FUZZY LOGIC

Course Code: IFT2321   **Credit Units:03**

Course Objective:
This course introduces the student to intelligent control theory,introduce Machine Intelligence
and to understand Fuzzy Logic .
Fuzzy logic is a tool that can be applied to ambiguous, complicated, complex or non-linear systems or problems which cannot be easily solved by classical techniques. This course discusses the fundamentals of fuzzy sets theory and fuzzy logic. In addition this course also introduces applications of fuzzy logic in several areas such as fuzzy control and fuzzy decision making.

Course Contents:

Module I: Introduction
Crisp sets: Overview, Fuzzy sets : Basic types and concepts,Characterstics and significance of paradigm shift, Fuzzy sets vs Crisp sets, Representation of fuzzy sets, Applications of fuzzy logic.

Module II: Fuzzy Logic
Fuzzy logic introduction, basic concepts of fuzzy logic, linguistic variable, possibility distributions, fuzzy rules, fuzzy rule based inference system, fuzzy inference systems, defuzzification.

Module III: Fuzzy Sets
Classical sets, set operation, fuzzy sets, representation of fuzzy sets, types of membership functions, designing membership functions, basic operations in fuzzy sets, introduction & features of membership functions, hedges, operations of fuzzy sets, properties of fuzzy sets.

Module IV: Fuzzy operations and Fuzzy airthmetic
Types of operations, Fuzzy complements, Fuzzy intersection:t-norms, Fuzzy union:t-conorms,Combination of operations, Aggregation operation, Fuzzy numbers , Linguistic variables,Airthmetic operations on intervals, Airthmetic operations on Fuzzy numbers, Lattice of Fuzzy numbers, Fuzzy equation.

Module V : Applications
Pattern recognition in fuzzy logic, Database and information retrieval in fuzzy logic, decision making in fuzzy logic, engineering applications and fuzzy logic, Fuzzy logic in Medicine and Economics.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
- Fuzzy sets and fuzzy logic theory and application by George. j. klir , Bo Yuan,ACM.
- Principles of soft computing by S.N.Sivanandam&S.N.Deepa, John Wiley &Sons.

References:
- A First Course in Fuzzy and Neural Control by Nguyen, Prasad, Walker, and Walker. CRC 2003
- Artificial Intelligence by Negnevisky. Addison-Wesley
- Automatic Control Systems by Colnaraghi and Kuo. 9thedition. Wiley Publisher. 2010

INTRODUCTION TO OBJECT ORIENTED PROGRAMMING WITH C++

Course Code: IFT2312   **Credit Units: 03**

Course Objective:
C++ is one of the most widely used programming languages for solving problems. The objective of this course is to provide object oriented programming fundamentals using C++. Topics to be covered include fundamentals of syntax & semantics of C++, loops & decisions, functions, classes and structures and features of classes such as overloading and inheritance, files, streams, pointers etc.

Course Contents:

Module I: Overview of C++
What is Object Oriented Programming, Characteristics of OOP, Difference between C and C++. Basics:-Input/Output in C++ using cin/cout, Preprocessor Directives, Data Types-Integer, Float, character, Enumerations, library functions, comments, storage classes, manipulators, operators in C++, scope resolution operator , memory management operator. arrays and strings .

Module II: Classes and objects
Functions: Simple functions, passing arguments to functions, returning values from functions, reference arguments, returning by reference, Overloaded functions, Inline functions, friend function , Structures and class.
Classes and objects: A simple class, C++ objects as physical objects, objects as function arguments, returning objects from functions, static class data, array as class data member, array of objects.

Module III: Inheritance
Inheritance, Types of Inheritance, access modes – public, private & protected, Abstract Classes, Ambiguity resolution using scope resolution operator and Virtual base class, Constructors, Types of constructors, Destructors.

Module IV: Polymorphism
Polymorphism, Type of Polymorphism – Compile time and runtime, Function Overloading, Operator Overloading (Unary and Binary) Polymorphism by parameter, Pointer to objects, this pointer, Virtual Functions, pure virtual functions.

Module V: Files and Exception Handling and I/O
Files and Streams: streams, string I/O, character I/O, file pointer, error handling, command line arguments.
formatted and Unformatted Input output, Introduction of Exception handling, Try Catch block, Rethrowing an Exception.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text
- Programming with C++, Ravi Chandran, TMH Publisher.
- Object Oriented Programming with C++, E Balagurusamy, Tata Mc Graw Hill
- Programming in C++, John R Hubbard, SCHAUM's series.

References:
- The complete reference C++, Herbert Schildt, TMH Publisher.
- Turbo C++, Robert Lafore, Galgotia Publications.

OPERATING SYSTEM

Course Code: IFT2314   **CreditUnits: 03**

Course Objective:
To study and apply concepts relating to operating systems, such as concurrency and control of asynchronous processes, deadlocks, memory management, processor and disk scheduling, parallel processing, and file system organization and Demonstrate an understanding of the differences between processes and threads, the different process or thread synchronization methods and the, the different memory management techniques used in Operating Systems, the different I/O management techniques used in Operating Systems, the tradeoffs in design and implementation concepts used in the development of Operating Systems.

Course Contents:

Module-I:Introduction and System Structure
What is an operating system, History of OS, OS concepts, Types of OS, OS Structure, OS Operations. System calls, Types of System Calls, System Programs, OS Structure, Virtual Machines, System Boot

Module-II:Process Management
Process Concept, Process Scheduling, Scheduling Criteria, Scheduling Algorithms, Overview of Thread Scheduling and Multiprocessor scheduling, Operations on Processes, Interprocess communication with example. Client-server Communication, Overview of Multithreaded programming models

Module-III:Process Coordination
 Overview of Process Synchronization, Critical Section Problem, Semaphores, Classic problems. Deadlock- Prevention, Avoidance, Detection, Recovery, Algorithms

Module-IV:Memory Management
 Memory Management Strategies-Introduction, Swapping, Contiguous Memory Allocation, Paging, Segmentation, Virtual Memory Management- Demand Paging, Thrashing, Page Replacement

Module-V:Storage Management
Overview of File System, Access Methods, Directory and Disk Structures, File Sharing, Protection, Disk Scheduling, Disk Management, I/O hardware

Module-VI:Protection and Security
Goals and Principles of Protection, Access Matrix, Security Problem, Program Threats, System and Network Threats, Overview of Cryptography, Overview of User Authentication and Security Defense.

Examination Scheme:

Components	CT1	A/C/Q/Q	Attd.	EE
Weightage (%)	15	10	5	70

Text & References:
Text :
- Operating System Principles , ArbrahamSilberschatz& Peter Baer Galvin by Wiley Student Publication
- Tannenbaum A.S., Modern Operating System,Pearson Publisher, 2015.

References:
- CrowlyCharrles, Operating System- A design Approach,Addison Publisher.
- Dietel H.M., Operating Systems, TMH Publisher.

SOFTWARE ENGINEERING

Course Code:IFT2319   **CreditUnits: 03**

Course Objective:
The purpose of this course is to acquaint students with the concepts and methods available for software development in industrial environments. Students will be exposed to a variety of topics such as design notations, costing techniques, and testing methods, as well as to the tools which are available to support software specification, design, testing, and maintenance.

Course Contents:

Module I: Software Development Life Cycle
Evolution of Software Engineering, Software Problems, Issues Involved in Software Engineering, Fundamental Qualities of a Software Product, Approaches to Software Engineering, Planning the development Process, Development/Product Life-Cycle Model, Kinds of Software Life-Cycle Model.

Module II: Project Management
Project Management Concepts, Project Management Activities, Size Metrics. Software Requirement analysis and Specification, Cost Models.

Module III: System Design
Design Objectives, Design Principles, Effective Modular Design (Functional Independence, Coupling, and Cohesion), Design Tools and Techniques, Prototyping, Structured Programming.

Module IV: Coding
Programming Practices, Verification, Monitoring and Control.

Module V: Software Testing
Testing Fundamentals, Test case design, Functional Testing, Structural Testing, Test Plan, Activities during testing, Unit System, Integration Testing, Software Maintenance.

Module VI: Software Reliability
Concept of Software Reliability, Software Repair and Availability, Software Errors, Failure and Faults.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
- Software Engineering, A Practitioner's Approach - Roger S. Pressman., Tata Mc Graw Hill

References:
- An Integrated Approach to Software Engineering, Pankaj Jalote., Narosa Publishing House
- Software Engineering Concepts, Richard Fairley., Tata Mc Graw Hill

ACCOUNTING AND FINANCIAL MANAGEMENT

Course Code:IFT2323   **Credit Units : 03**

Course Objective:
The objective of this course is to provide to students of IFT and IMCA with an introduction to fundamentals, concepts and principles / practices of Accounting and Financial Management. The topics covered including basic accounting, preparation of Trial Balance, Profit and Loss Account and Balance Sheet Account as applied to Banking including Bank Reconciliation Statement, Definition and Principles of Working Capital Management, Capital Budgeting and Analysis of Financial Statements.

Course Contents:

Module I: Accounting
Definition of Accounting, Its Objectives, Advantages and Limitation. Principles, Concepts and Conventions of Accounting, Double entry system, Recording of Transactions in subsidiary Books – Journal, Cash Book, sales Book, Purchase Book and Return Book. Posting into Ledger accounts.

Module II: Final Accounts
Preparation of Trial balance, Final Accounts including adjustments Trading account, Profit and Loss account, Balance Sheet.

Module III:Banking
Opening of different types of Banks Accounts, Cheque Book, Pass Book, Deposit slips, Bank Reconciliation Statements.

Module IV:Working Capital Management

Definition of working Capital, Types of Working Capital, Determinants of working Capital, Cash Management and Receivables Management.
Capital Budgeting: Principles and Techniques.

Module V: Analysis of Financial statements
Ratio Analysis: Meaning, Advantages, limitations, types of ratios and their usefulness Statements of charges in the Financial Position on Cash basis.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text & References:
- T.S Grewal, Book keeping,, S Chand Publishing
- Prasamna Chandra, Financial Management., Tata Mc Graw Hill
- IM Pandey, Financial Management., Vikas Publishing

INTRODUCTION TO OBJECT ORIENTED PROGRAMMING WITH C++ LAB

Course Code: IFT2315   **Credit Units: 01**

Course Contents:

1. WAP to calculate factorial of a given number n.
2. WAP to do the following:
    a. Generate the following menu:
        1. Add two numbers.
        2. Subtract two numbers.
        3. Multiply two numbers.
        4. Divide two numbers.
        5. Exit.
    b. Ask the user to input two integers and then input a choice from the menu. Perform all the arithmetic operations which have been offered by the menu. Checks for errors caused due to inappropriate entry by user and output a statement accordingly.
3. WAP to read a set of numbers in an array & to find the largest of them.
4. WAP to exchange contents of two variables using call by value.
5. WAP to exchange contents of two variables using call by reference.
6. Calculate area of different geometrical figures (circle, rectangle,square, triangle) using function overloading.
7. WAP to add two complex numbers using friend function.
8. WAP to maintain the student record which contains Roll number, Name, Marks1, Marks2, Marks3 as data member and getdata(), display() and setdata() as member functions.
9. WAP to increment the employee salaries on the basis of there designation (Manager-5000, General Manager-10000, CEO-20000, worker-2000). Use employee name, id, designation and salary as data member and inc_sal as member function (Use array of object).
10. Write a class bank, containing data member: Name of Depositor, A/c type, Type of A/c, Balance amount. Member function: To assign initial value, To deposit an amount, to withdraw an amount after checking the balance (which should be greater than Rs. 500) , To display name & balance.
11. WAP to define nested class 'student_info' which contains data members such as name, roll number and sex and also consists of one more class 'date' ,whose data members are day, month and year. The data is to be read from the keyboard & displayed on the screen.
12. WAP to generate a series of Fibonacci numbers using copy constructor, where it is defined outside the class using scope resolution operator.
13. Write a class string to compare two strings, overload (= =) operator.
14. Write a class to concatenate two strings, overload (+) operator.
15. Create a class item, having two data members x & y, overload '-'(unary operator) to change the sign of x and y.
16. Create a class Employee. Derive 3 classes from this class namely, Programmer, Analyst & Project Leader. Take attributes and operations on your own. WAP to implement this with array of pointers.
17. Create two classes namely Employee and Qualification. Using multiple inheritance derive two classes Scientist and Manager. Take suitable attributes & operations. WAP to implement this class hierarchy.
18. WAP to read data from keyboard & write it to the file. After writing is completed, the file is closed. The program again opens the same file and reads it.
19. WAP to creat a class student containing Name & class as parameters, create another class marks which inherit student class taking own data members as mark1 & mark2 &show result.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

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

OPERATING SYSTEM LAB

Course Code: IFT2320   **Credit Units: 01**

1. Write a Shell Script that takes a search string and filename from the terminal & displays the results.

2. Write a Shell Script that takes pattern and filename as command line arguments and displays the results appropriately i.e. pattern found/pattern not found.

3. Write a Shell Script that accepts only three arguments from the command line. The first argument is the pattern string, the second argument is the filename in which the pattern is to be searches and the third argument is the filename in which the result is to be stored.

4. Write a Shell Script which creates the following menu and prompts for choice from user and runs the chosen command.

        Today's date
        Process of user
        List of files
        Quit to UNIX

5. Write a Shell Script that computes the factorial of a given number

6. Write a Shell Script that changes the extension of a group of files from txt to doc

7. Write a Shell Script that accepts both filename and a set of patterns as positional parameters to a script.

8. Write a Shell Script which will redirect the output of the date command without the time into a file.

9. Write a Shell Script (using while loop) to execute endlessly (until terminated by user) a loop which displays contents of current directory, disk space status, sleep for 30 seconds and display the users currently logged in on the screen.

10. Write a Shell Script that receives two filenames as arguments. It should check whether content of the two files is same or not. If they are same, second file should be deleted.

11. If a number is input through the keyboard, WASS to calculate sum of its digits.

12. Write a Shell Script which takes a command line argument of Kms and by default converts that number into meters. Also provide options to convert km to dm and km to cm.

13. Write a Shell Script using for loop, which displays the message "Welcome to the UNIX System"

14. Write a Shell Script to change the filename of all files in a directory from lower-case to upper-case.

15. Write a Shell Script that examines each file in the current directory. Files whose names end in **old** are moved to a directory named **old files** and files whose names end in **.c** are moved to directory named **cprograms.**

16. Write a Shell Script which searches all files in the given directory (to be taken as command line argument) for the file having the title (to be taken as command line argument), as the first line in the file.

        a) Display the contents of the searched file.
        b) In the end, printthe the file is ###, where
        ### is small-sized if total no. of lines is <50
        ### is medium-sized if total no. of lines between 50&100
        ### is large-sized.

17. Write a shell script which reports names and sizes of all files in a directory (directory would be supplied as an argument to the shell script) whose size is exceeding 1000 bytes. The filenames should be printed in descending order of their sizes. The total number of such files should also be reported.

18. Write a shell script to calculate and print the first **m** Fibonacci numbers.

19. Write a shell script to compute the **GCD** and **LCM** of two numbers.

20. Write a shell script to generate all combinations of 1, 2 and 3 using **for loop.**

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

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

SUMMER INTERNSHIP EVALUATION-I

Course Code: IFT2335   **Credit Units: 03**

Objective:
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.

Guidelines
In order to achieve these objectives:

- **Each student will be allotted a supervisor** for proper guidance.
- **Student will first submit details of company, external guide, project title to coordinator/supervisor as per given schedule.**
- For internal assessment purpose, students will submit an industry feedback and a progress report.
- Student will maintain a file (**Internship File/Project Report**) which he/she will submit after completion of internship. **Further, coordinator will provide NTCC project guidelines and sample to help in preparation of 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 Report

1. File should be in the following specification
- A4 size paper
- Spiral Binding
- **Font**
For normal text Font Type and Size must be- Times New Roman, 12 pt. The minimum font size of materials within a table or a figure can be 10 point.

- **Margins**
A margin of 3.75 cm (1½ inch) is to be given on the binding edge while on the other sides it is to be 2.5 cm (1 inch). The text of the report, including headings, figures, tables, and notes, but excluding page numbers, must be accommodated within the page area.

- **Line Spacing**
The line spacing in the main text must be between one-and-a-half (1.5). Single line spacing should be given for figure captions, table titles, figure legends, and footnotes. Equations, tables, figures, and quotations should be set off from the main text with adequate space (not less than the normal line spacing adopted for the main text). Two consecutive paragraphs should be separated by a spacing which must be larger than the line spacing adopted for the text.

- **Tables and Figures**

Each sketch, drawing, graph and photograph should have a figure number and title below the figure etc. Numbering should be sequential, chapter wise. For instance, if there are 24 figures chapter 3 spread over all of its sections the figure numbers run from Figure 3.1 through Figure 3.24. In figures experimental data should typically be represented by centered symbols, and theoretical data by continuous curves.

Each table should have a table number and caption above the table. Numbering should be sequential, chapter wise, as in the case of Figure numbers. For instance, if there are 18 tables in chapter 3 the table numbers run from Figure 3.1 through Figure 3.18.

Make sure that figures and tables are complete in other respects such as legends, references (if any) and coordinate labels with units. Each figure and table must be explicitly referred to in the text and located where its first reference occurs, preferably after the reference.

- **Drawings**

All engineering drawings must conform to relevant Standards and should include a title block. If drawings are large they should be included at the back of the report in a separate pocket. In case drawings are made using CAD packages, a CD ROM should be included which contains all the files and details of the packages used.

- **Equations**

The numbering of equations should be sequential, chapter wise. Numbered equations must be explicitly referred to in the text.

2. Report Size: The maximum number of pages of the Report should be preferably between 50-80 pages.

3. Report Layout: The report should contain the following components
Front Page
Declaration
Student Certificate (University)
Certificate (Company)
Acknowledgement
Abstract
Contents
List of Figures
List of Tables
Company Profile (optional)
Chapters
Appendices(optional)
References / Bibliography

The above components are described below:
1. **The Title Page**-- Format will be given by coordinator/supervisor.
2. **Declaration by the Students-**This is page number (i), the beginning of the small case Roman numeral page numbers. The student has to give a declaration to the effect that the data used for the work, the work depicted in the report, and the written material contained in the report are not copied from others and that due permission has been taken from, and due credit has been given to, the sources whenever they are used.
3. **Certificate-**This is page number (ii). It is given by the Institute. The certificate will be signed by the Faculty Supervisor(s) before the viva-voce after verifying the format and by the Head of the Department after review with the Supervisor(s).
4. **Company Certificate:** This is a certificate, which the company gives to the students.

5. Contents-This is page number (iii). The table of Contents should be titled just Contents (not Table of Contents). Try to fit it into one or two pages.

6. Acknowledgement-This is page number (iv). Keep this brief and avoid using informal language. This page must be signed by the candidate.

7. Abstract and **Keywords-**This is page number (v). The abstract (preferably one page) should contain the context/relevance of the problem at hand, a description of what was done and a gist of the significant observations/results.

The keywords (maximum 6) are a hint that what is contained in the report.

8. Company Profile: A Company Profile corresponds to a file with company-specific data. Company data can be stored there and included in a booking when needed.

9. **Chapters**—Introduction, Literature Review/Background Study etc. as given by coordinator/supervisor.

10. **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

Continuous Internal Assessment
    40 Marks

Final Assessment
60 Marks

Continuous Internal Assessment consists of topic relevance, progress report and industry feedback on company letterhead. Final Assessment includes viva, presentation, execution and report marks.

Examination Scheme:

Components	IF	PR	R	E	V	FP
Weightage	20	20	15	15	15	15

V – Viva, IF – Industry Feedback, FP – Final Presentation, R – Report, PR-Progress Report, E-Execution

THEORY OF COMPUTATION

Course Code: IFT2417   **Credit Units: 04**

Course Objective:
The course begins with the basic mathematical preliminaries and goes on to discuss the general theory of automata, properties of regular sets and regular expressions, and the basics of formal languages. Besides, sufficient attention is devoted to such topics as pushdown automata and it's relation with context free languages, Turing machines and linear bounded automata, the basic concepts of computability such as primitive recursive functions and partial recursive functions.

Course Contents:

Module I: Introduction to Languages and Automata
Formal Grammars and Chomsky Hierarchy, Deterministic and Nondeterministic Finite Automata, NDFA to DFA conversion, Regular Expressions, Two way Finite Automata, Finite Automata with output, Properties of regular sets.

Module II: Context Free Grammars
CFG: Formal Definition, Derivation ofStrings, Derivation Tress and Syntax Trees, Removal of (€-removal, Unit production, Useless productions) from the given CFG, Ambiguous Grammar, Properties of CFL, Normal Forms : Chomsky Normal Form(CNF) and Greibach Normal Form(GNF).

Module III : Pushdown Automata
Push Down Automata(PDA): Definitions, Examples, Relationship between PDA and Context Free Language, Decision Algorithms

Module IV: Turing Machine
The Turing Machine Model, Language acceptability of Turing Machine, Design of TM, Universal TM, Church's Machine. Recursive and Recursively Enumerable Language, Unrestricted Grammars, Context Sensitive Languages, Linear Bounded Automata (LBA).

Module V: Undecidability
Turing machine halting Problem, Undecidable Problems for Recursive Enumerable Language, Post Correspondence Problems (PCP) and Modified Post Correspondence Problems(MPCP).

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
- Hopcroft and Ullman, "Introduction to Automata Theory, languages and computation", Addision Wesley.
- "An introduction to formal languages and Automata (2nded)" by Peter Linz, D. C. Health and Company.

References:
- "Introduction to theory of computation (2nd Ed)" by Michael sipser, Wadsworth.

COMPUTER GRAPHICS

Course Code: IFT2422   **CreditUnits: 03**

Course Objective:
The objective of this course is to present the basic principles for the design, use and understanding of computer graphics systems. Both hardware and software components of graphics systems are discussed here. This course also teaches the students about different algorithms for creating and manipulating graphics displays. Varieties of mathematical methods are used in various computer graphics algorithm.

Course Contents:

Module I: Introduction of Graphics
Development of Computer Graphics, Basic Graphics System and Standards.
Graphics Devices:
Raster and Random Scan Devices, Continual Refresh and Storage Displays, Display Processor, Color Display Techniques, Frame Buffer, Concepts in Raster Graphics and color generation.

Module II: Graphics Primitives
Points, Pixels, Scan Conversion, Line Drawing Algorithms, Circle Drawing Algorithms, Anti-aliasing Technique, Methods of Character generator.
Polygon
Polygon representation, Polygon Filling algorithm, Inside/Outside Testing

Module III: Transformation
Scaling, Translation, Rotation, Composite Transformation , Fix point scaling , Rotation about arbitrary point, Reflection, Shears, Composite Transformation, Modeling and Coordinate Transformation
Viewing: Interactive Picture Construction Techniques, Interactive Input/Output Devices,

Module IV: Segment
Segment Table, Creating Deleting and Renaming a Segment, Visibility and Image Transformation
Windowing and Clipping: Window, View-port, Line clipping, polygon clipping, Window to viewport transformation , polygon clipping using Sutherland Hodgman Algorithm.

Module V: 3-D Transformation and Visible surface detection
3-D Transformation : shearing, scaling , translation . rotation, Homogeneous coordinates.
Visible surface detection: Z - buffer algorithm, Scaline Visible surface detection algorithm, paintess algorithm, fractal and its.properties, Basic Illumination, diffuse reflection, specular reflection.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
- Computer Graphics By Donald Hearn And Pauline Baker, Pearson Education
- Harrington's "Computer Graphics " A Programming Approach, Tata Mc Gra Hill
References:
- Principle of Interactive Computer Graphics By New, W. M. And Spraull, Tata Mc Gra Hill
- Foley "Computer Graphics" Addission Wesley
- Rogers' "Procedural Elements Of Computer Graphics " Mc-Grawhilll

DATA COMMUNICATION AND COMPUTER NETWORKS

Course Code: IFT2418   **Credit Units: 03**

Course Objective:
The objective of the course is to provide introductory concepts in Data Communications such as Signaling, Encoding, Modulation, Error Detection & Correction. The course is also aimed at providing basic understanding of Computer networks starting with OSI Reference Model, Protocols at different layers with special emphasis on IP, TCP & UDP and Routing algorithms.

Course Contents:
Module I
Introduction to Data Communication, Networks-protocols, advantages, disadvantages & applications, Line Configuration, topology, Transmission mode, Classification of networks. OSI Model, functionality of layers in OSI model, Protocols at each layer, encapsulation, peer-to-peer communication.

Module II:
Parallel & Serial Transmissions, Analog & Digital Signals, Periodic & Aperiodic Signals, Data encoding techniques-Digital data-digital signals, Digital data-Analog signals, Analog data- Digital signals, Analog data- Analog signals, Multiplexing.

Module III
Transmission Media-Twisted Pair Cable, Coaxial Cable, Fiber-Optics Cable, Radio frequency Allocation, Terrestrial Microwave, Infrared rays, Satellite Communication, Cellular Telephony. Introduction to ISDN.

Module IV
Framing, Switching, Types of Errors, Error Detection & Correction (VRC, LRC, CRC, Checksum, Hamming Code), Flow Control (Stop-and-wait & Sliding Window), Error Control (Stop & Wait ARQ, Sliding Window ARQ using Go-back n method and Selective-Reject), IEEE Standards-802.3, Token Bus (802.4), Token Ring (802.5), FDDI.

Module IV
Routing process, Routing Algorithms-Shortest Path Routing, Flooding, Distance Vector Routing, Link State Routing, Addressing-IPv4, IPv6, Internetworking, Connection–oriented Vs Connectionless protocols- TCP,UDP.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
- Data Communication and Networking by Behrouz Forouzan,FourthEdition,TMH.
- Computer Networks by A.S. Tanenbaum, Fifth Edition, Prentice Hall.

References:
- Data and Computer Communications by W. Stallings, Prentice Hall.

DESIGN AND ANALYSIS OF ALGORITHM

Course Code: IFT2413   **Credit Units: 03**

Course Objective:
The designing of algorithm is an important component of computer science. The objective of this course is to make students aware of various techniques used to evaluate the efficiency of a particular algorithm. Students eventually should learn to design efficient algorithm for a particular problem. Upon completion of this course, students will be able to do the following:
- Analyze the asymptotic performance of algorithms.
- Demonstrate a familiarity with major algorithms and data structures.
- Apply important algorithmic design paradigms and methods of analysis.
- Synthesize efficient algorithms in technical design situations.

Course Contents:

Module I: Introduction
Algorithm Design paradigms - motivation, concept of algorithmic efficiency, concept of running time, analysis of algorithms, Growth of Functions, Asymptotic Notations, Structure of divide-and-conquer algorithms, analysis of divide-and-conquer algorithms, example algorithms - Quick Sort, Merge Sort, Strassen Multiplication, Recurrences- Substitution Method, Recursion Tree Method, Iteration Method , Master's Method.

Module II: Advanced Design Techniques
Greedy Algorithms - Introduction, elements of greedy strategy, Fractional Knapsack Problem, activity selection problem,
Dynamic Programming - Overview, difference between dynamic programming and divide and conquer, Matrix Chain Multiplication, Longest Common Sub-sequence, 0/1 - Knapsack Problem. Difference between Greedy and Dynamic Programming Approach.

Module III: Graph Algorithms
Representation of Graphs, Graph Traversal - BFS and DFS, Topological Sort, Strongly Connected Components.
Minimum Spanning Tree, Kruskal's Algorithm, Prim's Algorithm, , Single Source Shortest Paths, Dijkstra's Algorithm, Bellmanford Algorithm, All Pair Shortest Path Problem, Floyd Warshall's Algorithm.

Module IV: Selected Topics
Back tracking - Introduction, n-Queens Problem, NP-Completeness – Definition and examples of Class P, NP, NP-Hard and NP Complete, Polynomial reduction. Approximation Algorithms – Introduction, Performance Bounds, Example Problems – Vertex Cover Problem, Travelling Salesperson Problem. Randomized Algorithms.
Application of algorithms in different areas of Computer Science.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
- T. H. Cormen, Leiserson, Rivest and Stein, "Introduction of Computer algorithm,", PHI

References:
- E. Horowitz, S. Sahni, and S. Rajsekaran, "Funadmentals of Computer Algorithms," Galgotia Publication
- Sara Basse, A. V. Gelder, "Computer Algorithms," Addison Wesley
- J.E Hopcroft, J.D Ullman, "Design and analysis of algorithms"., Addison Wesley
- D. E. Knuth, " The art of Computer Program, Addison esley

COMPUTER GRAPHICS LAB

Course Code: IFT2423   **Credit Units: 01**

1) Write a program to change the working mode from text to graphics and plot a pixel.
2) Write a program to draw a line of same dimension in three different graphics mode.
3) Write a program to display line, rectangle, circle and polyline using graphics command.
4) Write a program to draw a line of slope between 0 and 1 using DDA algorithm.
5) Write a program to draw a line of slope between 1 and ∞ using DDA algorithm.
6) Write a program to draw a line of slope between 0 and 1 using midpoint algorithm.
7) Write a program to draw a line of slope between 1 and ∞ using midpoint algorithm
8) Write a program to draw a dashed line of slope 1 using any line algorithm
9) Write a program to draw a dotted line of slope 1 using DDA algorithm
10) Write a program to draw a line of slope between 0 and -1 using midpoint algorithm.
11) Write a program to draw a line of slope between -1 and -∞ using midpoint algorithm.
12) Write a program to draw an octant of a circle with it's center at point (0,0) a using midpoint circle drawing.
13) Write a program to draw a circle with its center at point (0, 0) and radius r using midpoint circle drawing.
14) Write a program to draw an octant of a circle with it's center at point (a, b) and radius r using midpoint circle drawing.
15) Write a program to a circle with it's center at point (a, b) and radius r using midpoint circle drawing.
16) Write a program to fill a polygon using flood-fill method.
17) Write a program to fill a polygon using boundary-fill method.
18) Write a program to reflect a point in X and Y-axis both.
19) Write a program to rotate a point (100, 50) about origin in anti-clock wise direction.
20) Write a program to rotate a point (100,150) about point (30, 40) in clock wise direction..

Examination Scheme:

Components	IF	PR	R	E	V	FP
Weightage (%)	20	20	15	15	15	15

V – Viva, IF – Industry Feedback, FP – Final Presentation, R – Report, PR-Progress Report, E-Execution

DATA COMMUNICATION AND COMPUTER NETWORKS LAB

Course Code: IFT2420   **Credit Units: 01**

Course Objective:
The course familiarizes with the equipment applications and protocols installed in enterprise networks, with a focus on switched networks, IP Telephony requirements, and security. It also introduces advanced routing protocols such as Enhanced Interior Gateway Routing Protocol (EIGRP) and Open Shortest Path First (OSPF) Protocol. Hands-on exercises include configuration, installation, and troubleshooting.

Course Contents:
1. Drawing an Enterprise Network for Amity University showing its different campuses across the country.
2. Configuring all the devices (PCs, Servers, Switches) to create a LAN within campuses of the Enterprise Network.
3. Configuring Virtual LANs (VLANs) in an Enterprise Network.
4. Configuring Trunking and Inter-VLAN Routing in an Enterprise Network.
5. Implementing RIP (Routing Information Protocol) to enable communication between different LANs.
6. Implementing OSPF (Open Shortest Path First) to enable communication between different LANs.
7. Implement EIGRP (Interior Routing Protocol) to establish connectivity within domestic campuses of the Enterprise Network.
8. Implement BGP (Border Gateway Protocol) and Redistribution to establish connectivity between different campuses of the Enterprise Network.
9. Configuring WAN connectivity using protocols-HDLC and PPP.
10. Implementing Frame-Relay to configure WAN service provider cloud.
11. Configuring Standard and Extended ACLs on a Router.
12. Troubleshooting Switching, Routing and ACL issues.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

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

DESIGN AND ANALYSIS OF ALGORITHM LAB

Course Code:IFT2421   **CreditUnits: 01**

Lab assignment will be based on the following:

- Programs sorting algorithms based on divide and conquer technique.
- Programs on algorithm based on greedy method.
- Programs on algorithm based on Dynamic programming.
- Programs on Graph Algorithms.
- Programs on algorithm based on backtracking.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

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

COMPUTER ORIENTED NUMERICAL METHODS

Course Code: IFT2517   **Credit Units : 03**

Course Objective:
The objective of this course is to provide conceptual understanding of various numerical methods, in particular, with reference to numerical solution of non linear equations and system of linear equations, interpolation, numerical differentiation and integration and numerical solution of ordinary differential equations. Important theorems and different formulae for various numerical methods to be covered with an aim of helping the students to understand the fundamentals, concepts and practical use of these methods in the field of computer sciences and applications.

Course Contents:

Module I: Numeric Computation
Computer Arithmatic- Floating point numbers-operations, Normalization and their Consequences, Absolute, Relative and Percent Error.
Iterative Methods:- Zeros of a single Transacendental equations and Zeros of Polynomial Equations using Bisection ,False Position, Newton-Raphson Methods, Convergence of Solution.

Module II: Simultaneous Linear Equations
Solution of Simultaneous Linear Equations. Direct Methods:- Gauss elimination method, Pivoting, Gauss-Jordan Method. Iterative methods:-Jacobi's Methods, Gauss-Seidal Method.

Module III: Polynomial Interpolation
Newtons divided difference, Forward and backward difference Formulae, Difference Tables, Lagrange's Method.

Module IV: Numerical Differentiation and Integration

Formula for first and second order derivatives using newton's- Forward and Backward formula, Numerical Integartion, Newton-Cotes Formula: Trapizoidal rule, Simpson's 1/3rd rule ,Simpson's 3/8th rule, Weddle's rule.

Module V: Numerical Solution of Differential Equations
Basic Terminology of Differential Equations, Picard's Method, Euler's method, Taylor's Series method, Runge-Kutta Methods, Predictor –Connector Method.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
- Jain M.K, Jain R.K andIyenger, Numerical Methods for Scientific and Engineering Applications, New Age international publishers

References:
- Rajaraman V, Computer Oriented Numerical Methods. PHI Learning pvt ltd
- Krishnamuty, E.V., Sen, S.K, Computer Based Numerical Algorithms. East West Press 1976

COMPILER DESIGNING

Course Code: IFT2521   **CreditUnits 03**

Course Objective
The objective of the course is to make students learn the concepts of compiler design. It includes an understanding about all the phases of compiler like lexical analysis, syntax analysis, semantic analysis, code generation and code optimization. Students will learn both theoretical and numerical based approaches of compiler design and construction.

Course Contents:

Module I: Introduction
Compilers and translators , Need of Translators, Review of compiler phases – Informal Compiler Algorithm Notation – Symbol Table Structure – Intermediate Representations – Run Time Issues, Review of compiler phases – Informal Compiler Algorithm Notation – Symbol Table Structure – Intermediate Representations – Run Time Issues.
Lexical Analysis : Role of Lexical Analyzer, Regular Expression, Finite Automata., NFA, DFA, NFA to DFA Conversion

Module II: Syntax Analysis Phase
Role of parsers, context free grammar, Context free grammar, Leftmost and right most derivations & Ambiguity.
Parsing Techniques: Left Recursion , Left Factoring. Calculating First & follow, Shift Reduce Parsing, Operator precedence parsing, Predictive parsing , LL(1) Parsing.

Module III: Syntax Directed Translation
Syntax directed Translation Schemes, Implementation of Syntax directed translators, Intermediate Code, Postfix notation, Parse Trees and Syntax Trees, Three address Code, Quadruple & Triples
Symbol Tables: Symbol tables , its contents & data structures for symbol tables , trees, arrays an hash table

Module IV: Error detection and Recovery
Lexical phase errors, syntax phase errors, semantic errors
Code Optimization: The Principal Sources of Optimization, Causes of Redundancy, A Running Example: Quick sort, Semantics-Preserving Transformations, Global Common Sub expressions, Copy Propagation, Dead-Code Elimination, Code Motion, Induction Variables and Reduction in Strength.
The DAG   representation of basic blocks, value numbers and Algebraic Laws, Global Data – Flow Analysis.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
- Alfread V. Aho, Ravi Sethi& J.D. Ullman, "Compiler Design", Addison Wesley
- Ullman, Principles of Compiler Design, Narosa publications.

References:
- D.M. Dhamdhere, "Compiler Construction – Principles & Practice", Macmillan India Ltd.
- Holub, "Compiler Design in C", PHI.
- Tremblay K.P & Sorenson P.G., "The Theory and practice of Compiler writing" McGraw Hill
- Waite W.N. and Goos G., "Compiler Construction" Springer Verlag.

JAVA PROGRAMMING

Course Code: IFT2510   **Credit Units: 03**

Course Objective:
The objective of this course is to give proficiency in developing applications and applets in Java, in-depth knowledge of object oriented concepts, developing GUI applications in Java, creation of packages, Event Handling, Layout Manager, SWING and String handling in Java

Course Contents:

Module I: Introduction to Java Programming
Concepts of OOP, Features of Java, How Java is different from C++, Data types, Control Statements, identifiers, arrays, operators. Variables, Applications and Applets, Classes and methods, Constructor, method overloading, Inheritance: method overriding, Abstract classes, Final classes, String classess

Module II: Java Packages and interfaces
Package creation, Packages deployment, using packages, Interfaces, Exception Handling and Multithreading

Module III: AWT and Event Handling
Introduction to AWT, Layout Manager, Event handling Mechanism, Event Model, Event Classes, Sources of Events, Event Listener Interfaces, AWT: Working with Windows, AWT Controls,Html basic tags, Applet Classes,

Module IV: Java Swings
Swing classes & controls. Advantages of Swing over AWT, event handling

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
- Naughton, Schidt "The Complete Reference JAVA 2 " TMH

References:
- Balaguruswamy "Programming in JAVA", Tata Mc Graw Hill
- Deitel&Deitel "Java™ How to Program, 6/E**",** Prentice Hall

LINUX

Course Code: IFT2522   **Credit Units: 02**

Course Objective:
The Objective of this course is to explore the idea of linux platform to graduate students. The fundamentals concepts of linux Operating System, commands and Shell Programming will be prepared by the students to work on Linux platform, which is the requirement of each industry and in academic The syllabus will cover the study of scripting languages such as PERL, TCL/TK and BASH Creation of programs in the Linux environment, the principles of scripting languages and usage of scripting languages in IC design flow.

Learning Outcomes:
- Ability to create and run scripts using Perl / TCL
- Ability to use Linux environment and write programs

Course Contents:

Module I: Introduction
History of Operating System, Types of Operating Systems, History of Linux and Unix, UNIX Family, Unix System Architecture, Kernel, Shell: Types of shells, Files and Directories, Absolute Path and Relative Path, root and hierarchical file structure of Unix, telnet, Introduction to linux server security and administration.

Module II:Linux Basics
Introduction to Linux, File System of the Linux, General usage of Linux kernel & basic commands, Linux users and group, Permissions for file, directory and users, Searching a file & directory, zipping and unzipping concepts

Module III: Linux Networking
Introduction to Networking in Linux, Network basics & tools, File transfer protocol in Linux, Network file system, Domain Naming Services, Dynamic hosting configuration Protocol &Network information Services.

Module IV: Perl Scripting and Tcl/tk Scripting
Introduction to Perl Scripting, working with Simple Values, Lists and Hashes, Loops and Decisions, Regular Expressions;Data Structures, Control Flow Commands, Procedures and Scope, Evel, Working With UNIX, Reflection and Debugging, Script Libraries, Tk Fundamentals, Tk by Examples, The Pack Geometry Manager, Binding Commands to XEvents, Buttons and Menus, Simple Tk Widgets, Entry and Listbox Widgets Focus, Grabs and Dialog.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
- Linux: The Complete Reference 6th Edition, Richard Petersen, Mcgraw Hill Education, ISBN: 9780070222946, 0070222940, 6th Edition.
- Sumitabha Das, "UNIX: Concepts and Application", TMH.

References:
- http://nptel.ac.in/syllabus/syllabus_pdf/117106113.pdf.
- https://www.tutorialspoint.com/tcl-tk/tcl_data_types.htm.
- Red Hat Enterprise Linux 4: System Administration Guide Copyright 2005 Red Hat, Inc.
- Mastering Unix Shell Scripting: Bash, Bourne, and Korn Shell Scripting for Programmers, System Administrators, and UNIX Gurus. Randal K. Michael. Wiley
- Linux: Learning the Essentials, James K L, Phi Learning Private Limited, ISBN: 9788120344754, 8120344758, Edition: 2011.
- Kanetkar. "UNIX Shell Programming" BPB
- Linux Server Security: Hack and Defend, Chris Binnie, Wiley, ISBN: 9788126563227, 8126563222,Edition: 2016

JAVA PROGRAMMING LAB

Course Code: IFT2511   **Credit Units: 01**

Course Contents:

1. Create a "Hello, World" program that simply prints out that statement.
2. Write a program that prints three arguments taken from the command line.
3. Write a program that prints values from 1 to 100.
4. Create a class with a default constructor (one that takes no arguments) that prints a message. Create an object of this class.
5. Write Java assignment statements to evaluate the following equations:
   (i)   Energy = mass(acceleration*height+(velocity)sqr(2)/2)
   (ii)   Torque = 2m1m2/m1+m2 * g
6. Design and write a Java program to define a class called Rectangle that contains members for representing its length and breadth. Provide members to get and set these attributes.
7. Design a class to represent a bank account. Include the following members:
Data members:
Name of the depositor
Account number
Type of account
Balance amount in the account
Methods:
To assign initial values
To deposit an amount
To withdraw an amount after checking balance
To display the name and balance
8. Write simple program to calculate the sum of digits of any number.
9. Write a simple program to display a "*" I triangle shape.
Output will be like this
        *
     * * *
    * * * * *
10. Write a simple program to call a method called simple from a main function. The method simple should accept an integer as an argument and calculate the square of the number in the method simple.
11. Write a Java program to add two integers and two float numbers. When no arguments are supplied, give a default value to calculate the sum. Use method overloading to achieve this.
12. Write a program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Create another class called MultDiv that extends from AddSub class to use the member data of the superclass. MultDiv should have methods to multiply and divide. A main method should access the method and perform the mathematical operations.
13. Write an interface with a method called display. Implement this method I a class to display two names.
14. Write an interface that has two methods called push and pop of a stack. Write a class to implement the two methods for a fixed size stack creation.
15. Write a small program to catch Negative Array Size Exception. This exception is caused when the array is initialized to negative values.
16. Write a program to handle Null Pointer Exception and use the finally clause to display a message to the user.
17. Write a Java program that takes a string and converts it into uppercase and lowercase letters.
18. Write a Java program to find the volume of a sphere and a cone.
19. Write a Java program to convert rupees to dollars.
20. Write a Java program to find x to the power y. Use overloading for different cases when x and y are combinations of integer and floating point numbers.

21. Create an abstract class called Figure that has an abstract method called draw (). Make the subclasses called Filled_Rectangle, Filled_Arc and override the draw method in which you would print the message regarding the current object.
22. Write a Java program that has integer variables a, b, c and result as float. Store some values in them and apply the formula result = a/(b-c). Catch the probable exception.
23. Write applets to draw the following shapes:
    (i) Cone
    (ii) Cylinder
    (iii) Cube
    (iv) Square inside a circle
    (v) Circle inside a square

24. Write an applet to display the following figure:
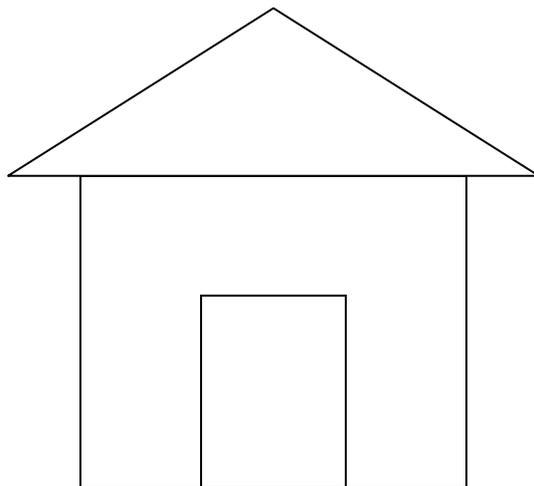
25. Write an swings to display five buttons and five labels.
26. Write a Java program to create 5 threads by extending Thread class.
27. Write a Java program to create 5 threads by implementing Runnable interface.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

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

SUMMER INTERNSHIP EVALUATION-II

Course Code: IFT2535   **Credit Units: 03**

Objective:
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.

Guidelines
In order to achieve these objectives:

- **Each student will be allotted a supervisor** for proper guidance.
- **Student will first submit details of company, external guide, project title to coordinator/supervisor as per given schedule.**
- For internal assessment purpose, students will submit an industry feedback and a progress report.
- Student will maintain a file (**Internship File/Project Report**) which he/she will submit after completion of internship. **Further, coordinator will provide NTCC project guidelines and sample to help in preparation of 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 Report

1. File should be in the following specification
- A4 size paper
- Spiral Binding
- **Font**
For normal text Font Type and Size must be- Times New Roman, 12 pt. The minimum font size of materials within a table or a figure can be 10 point.

- **Margins**
A margin of 3.75 cm (1½ inch) is to be given on the binding edge while on the other sides it is to be 2.5 cm (1 inch). The text of the report, including headings, figures, tables, and notes, but excluding page numbers, must be accommodated within the page area.

- **Line Spacing**
The line spacing in the main text must be between one-and-a-half (1.5). Single line spacing should be given for figure captions, table titles, figure legends, and footnotes. Equations, tables, figures, and quotations should be set off from the main text with adequate space (not less than the normal

line spacing adopted for the main text). Two consecutive paragraphs should be separated by a spacing which must be larger than the line spacing adopted for the text.

- **Tables and Figures**

Each sketch, drawing, graph and photograph should have a figure number and title below the figure etc. Numbering should be sequential, chapter wise. For instance, if there are 24 figures chapter 3 spread over all of its sections the figure numbers run from Figure 3.1 through Figure 3.24. In figures experimental data should typically be represented by centered symbols, and theoretical data by continuous curves.

Each table should have a table number and caption above the table. Numbering should be sequential, chapter wise, as in the case of Figure numbers. For instance, if there are 18 tables in chapter 3 the table numbers run from Figure 3.1 through Figure 3.18.

Make sure that figures and tables are complete in other respects such as legends, references (if any) and coordinate labels with units. Each figure and table must be explicitly referred to in the text and located where its first reference occurs, preferably after the reference.

- **Drawings**

All engineering drawings must conform to relevant Standards and should include a title block. If drawings are large they should be included at the back of the report in a separate pocket. In case drawings are made using CAD packages, a CD ROM should be included which contains all the files and details of the packages used.

- **Equations**

The numbering of equations should be sequential, chapter wise. Numbered equations must be explicitly referred to in the text.

2. Report Size: The maximum number of pages of the Report should be preferably between 50-80 pages.

3. Report Layout: The report should contain the following components
Front Page
Declaration
Student Certificate (University)
Certificate (Company)
Acknowledgement
Abstract
Contents
List of Figures
List of Tables
Company Profile (optional)
Chapters
Appendices(optional)
References / Bibliography

The above components are described below:
1. **The Title Page**-- Format will be given by coordinator/supervisor.
2. **Declaration by the Students-**This is page number (i), the beginning of the small case Roman numeral page numbers. The student has to give a declaration to the effect that the data used for the work, the work depicted in the report, and the written material contained in the report are not copied from others and that due permission has been taken from, and due credit has been given to, the sources whenever they are used.

3. Certificate-This is page number (ii). It is given by the Institute. The certificate will be signed by the Faculty Supervisor(s) before the viva-voce after verifying the format and by the Head of the Department after review with the Supervisor(s).

4. Company Certificate: This is a certificate, which the company gives to the students.

5. Contents-This is page number (iii). The table of Contents should be titled just Contents (not Table of Contents). Try to fit it into one or two pages.

6. Acknowledgement-This is page number (iv). Keep this brief and avoid using informal language. This page must be signed by the candidate.

7. Abstract and **Keywords-**This is page number (v). The abstract (preferably one page) should contain the context/relevance of the problem at hand, a description of what was done and a gist of the significant observations/results.

The keywords (maximum 6) are a hint that what is contained in the report.

8. Company Profile: A Company Profile corresponds to a file with company-specific data. Company data can be stored there and included in a booking when needed.

9. **Chapters**—Introduction, Literature Review/Background Study etc. as given by coordinator/supervisor.

10. **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

Continuous Internal Assessment	Final Assessment
40 Marks	60 Marks

Continuous Internal Assessment consists of topic relevance, progress report and industry feedback on company letterhead. Final Assessment includes viva, presentation, execution and report marks.

Examination Scheme:

Components	IF	PR	R	E	V	FP
Weightage (%)	20	20	15	15	15	15

V – Viva, IF – Industry Feedback, FP – Final Presentation, R – Report, PR-Progress Report, E-Execution

MULTIMEDIA & ITS APPLICATIONS

Course Code: IFT2608   **CreditUnits: 03**

Course Objective:
The objective of the course is to give an overview of different multimedia technologies like audio and video including multimedia devices. The course also includes some practical sessions on these technologies.

Course Contents:

Module I: Introduction
Introduction: Objectives – History of Multimedia – Its market – Content copyright – Resources for multimedia developers – Types of produces – Evaluation – Hardware Architecture – OS and Software – Multimedia Architecture – Software library – Drivers.

Module II: Digital Audio Representation and Processing
Uses of audio in computer applications, digital representation of sound, transmission of digital sound, digital audio signal processing, digital audio and the computer.

Module III: Video Technology
Raster scanning principles, sensors for T.V. cameras, color fundamentals, color video, video equipment, worldwide television standards.

Module IV: Digital Video and Image Compression
Evaluating a compression system, redundancy and visibility, video compression techniques, the JPEG image compression standards, the MPEG motion video compression standard, DVI technologies, Time Based Media Representation and Delivery.

Module V: Multimedia Devices, Presentation Services and the User Interface
Introduction .Multimedia services and Window systems, client control of continuous media, device control, temporal co ordination and composition, hyper application.

Module VI: Application of Multimedia
Intelligent multimedia system, desktop virtual reality, multimedia conferencing.

Examination Scheme:

Components	CT1	PR.	ATTD.	EE
Weightage (%)	15	10	5	70

Text & References:
- Multimedia systems John F. Koegal Buford Addison- Wesley

INTRODUCTION TO OPEN SOURCE TECHNOLOGIES
(PHP, MySql)

Course Code: IFT2618   **Credit Units: 03**

Course Objective:
This course is aimed to provide a fundamental understanding of dynamic web site creation. PHP is the language used for development of most common web sites. Syllabus includes basic and advanced features of PHP which includes detailed introduction of PHP and MYSQL, Arrays, Loops and variables etc. It also gives an overview open source framework like JOOMLA, ZEND etc...

Course Contents:
Module I: Introduction to Open Source and PHP programming
Introduction to Open Sources Technologies, Introduction to PHP, installation and configuration, Advantages and Disadvantages of PHP, Client Side Scripting, Server Side Scripting, Variables, data types, various types of function, creating your own function, Strings in PHP, String Functions.

Module II: Operator, Loops, Array, Exception and Error Handling
Operators, Conditions, Loops, Using for each, Creating and Using Arrays, Multidimensional Array, Associative array.
Error Handling in PHP, Errors and Exceptions, Exception class, try/catch block, throwing an exception, defining your own Exception subclass.

Module III: Classes, File system, Passing Information between pages
Object orientedprogrammingwithPhp, Working with Datetime, code re-use, require (), include(), and the include_path; Understanding PHP file permissions, File reading and writing functions, File system functions, File uploads, Sending mail & use of email server.
HTTP, GET arguments, POST arguments, Using Session in PHP, cookies, The setcookie() function, Deleting Cookies and Reading Cookies.

Module IV: Workingwithdatabase
HTML Tables and Database tables, Databasemanipulation(Select, Insert, Update, Delete), validating User Input usingJavascript.
MYSQL, Introducing MySQL; database design concepts; the Structured Query, Language (SQL); communicating with a MySQL backend via the PHP, MySQL APIBuilding Database Applications,

Module V: WorkingwithFrameworks
Working with Mambo, Working with Joomla, Working with framework. Use of Joomla in rapid development of website. Developing of simple website using joomla.

Examination Scheme:

Components	CT1	A/C/Q	ATTD.	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
- Beginning PHP, Apache, MySQL Web Development, Michael K. Glass, Yann Le Scouarnec, Elizabeth Naramore, Gary Mailer, Jeremy Stolz, Jason Gerner, published by Wiley, wrox

References:
- The Complete Reference PHP, by Steven Holzner, Tata McGraw-Hill Publication
- Beginning PHP and MYSQL, by W. Jason Gilmore, Apress Publication

MOBILE COMPUTING

Course Code: IFT2611   **Credit Units: 03**

Course Objective:
The course objectives are to make the student understand the concept of mobile computing paradigm, Its novel applications and limitations, to understand the typical mobile networking Infrastructure through 2G technologies (GSM, GPRS, EDGE), 3G technologies (WCDMA, UMTS, HSPA), to understand the issues and solutions of various layers of mobile networks, WLANs and Mobile IP, to understand the Global Mobile Satellite Systems, to understand the advanced techniques and current trends (4G and 5G networks)

Course Contents:

Module I: Introduction
Introduction to cellular engineering, Frequency Re-use, Channel Assignment Strategies, Fixed and Dynamic Channel Assignment Strategies, Handoff Process, Factors affecting Handoff Process, Handoff detection Strategies, Few practical cases of Handoff Scenario, Interference and System Capacity, Cell Splitting, Sectoring, History of Mobile phone generations, 1G technology

Module II: Second Generation (2G) Mobile Technologies
PCS Architecture, Mobility management in PCS, GSM, Architecture, GSM addresses and identifiers, Protocol Stack, GSM security, Mobility Management in GSM,GPRS (2.5G), GPRS Architecture, GPRS Network Nodes, Protocol Stack.

Module III: Mobile Data Communication
Bluetooth: Architecture, Network and Protocol stack.
WLANs (Wireless LANs), Modes of operation of WLANs, IEEE 802.11 standard, System Architecture, Protocol stack, Wireless) Multiple Access techniques: SDMA, FDMA, TDMA, CDMA. Mobile IP, Motivation, Problems, Data Transfer, Encapsulation and tunneling.
Wireless Application Protocol (WAP): The Mobile Internet standard, WAP Gateway and Protocols, Wireless Markup Languages (WML).

Module IV:Third Generation (3G) Mobile Technologies
Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, 3GPP, UMTS, Wideband Code Division Multiple Access (W-CDMA), CDMA 2000, HSPA, Wireless Local Loop (WLL): Introduction to WLL Architecture, wireless Local Loop Technologies.

Module V: Global Mobile Satellite Systems
Global Mobile Satellite Systems, Global History, Applications, Classical Satellite System, Terminologies, Geostationary and Geosynchronous Satellites, Types of Orbits based upon distance from Earth (LEO, MEO, GEO, HEO), Based upon Eccentricity (Circular and Elliptical), Routing, Localization and Handover in satellite systems, case studies on IRIDIUM and GLOBALSTAR LEO satellite systems.

Module VI:Forth Generation (4G) Mobile Technologies and Current Trends
4G standard: IMT Advanced requirement, Long Term Evolution, architecture, Mobile IPV6 (MIPV6), WiMax standard IEEE 802.16, VoIP, VoLTE, Presence Aware Technology, Pervasive Networks, NFC (Near Field Communication), Overview into 5G technology, NGMNA and IoT.

Examination Scheme:

Components	CT1	A/C/Q	ATTD.	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
- JochenSchiller,"MobileCommunications",Addison-Wesley, second edition, 2004
- Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", Wiley, 2002, ISBN 0471419028

References:
- Mark Ciampa, Thomson learning ,"Guide to Designing and Implementing wireless LANs",Vikas Publishing House, 2001
- Yi-Bing Lin &ImrichChlamtac ,"Wireless and Mobile Networks Architectures", John Wiley & Sons, 2001.
- Raj Pandya,"Mobile and Personal Communication systems and services", Prentice Hall of India, 2001.
- AfifOsseiran**,** Jose F. Monserrat**,**PatrickMarsch**,** "5G Mobile and Wireless Communications Technology", Cambridge University Press, October 2016
- Arunabha Ghosh, Jun Zhang , Jeffrey G. Andrews, Rias Muhamed, "Fundamentals of LTE", Princeton Hall, First Edition

CRYPTOGRAPHY & NETWORK SECURITY

Course Code: IFT2621   **Credit Units: 03**

Course Objective:
Network Security was always important, but has gained significance with the increase of application of Internet associated e-commerce. Threat and compromise /Breach potentially increased with the introduction of the end user involment,communication and networking .Thus the course is introduced to make the student acquainted with the concepts and practices to make the network environment secure.

Module-I:
Integer arithmetic, modular arithmetic, matrices, Linear Congruence: Definition – Basic properties of congruence, Divisibility - Greatest common divisor, equivalence classes, residue classes. Chinese remainder theorem, Euclid and Extended Euclid, modular inverse, exponentiation and logarithm. Algebraic structures: groups, fields, rings, Modulo groups - Primitive roots - Discrete logarithms.

Module-II:
Introduction to security attacks, services and mechanism, Classical encryption techniques, substitution cipher:ceaser cipher, playfair cipher, mono/polyalphabetic cipher, hill cipher, affine cipher. Transposition techniques: columnar cipher,rail fence cipher up to two round.

Module-III:
Stream and block ciphers. Modern Block Ciphers: Block ciphers principles, Shannon's theory of confusion and diffusion, fiestal structure, Data encryption standard (DES), Strength of DES.

Module-IV:
Principals of public key crypto systems, RSA algorithm, security of RSA. Message Digest: Authentication requirements, authentication functions, hash function and SHA-1,message authentication code. Concept of Digital Signature. Diffie-Hellman Key Exchange.

Module-V:
IP Security: Architecture, Authentication header, Encapsulating security payloads, HTTPS, Viruses, Worms, Malware, Botnets, Firewall and its types.

Examination Scheme:

Components	CT1	A/C/Q	ATTD.	EE
Weightage (%)	15	10	5	70

Text & References:
Text :
- "Cryptography & Network Security", William Stallings, PHI
- "Cryptography & Network Security", Behrouz A. Forouzan, TMH
- "Cryptography & Network Security", AtukKahate, PHI

DATA WAREHOUSING &DATA MINING

Course Code: IFT2604   **Credit Units: 03**

Course Objective:
This course 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:Introduction to Data Warehousing
Data Warehouse definition & Characteristics, The need for data ware housing, Operational and Informational Data Stores, Difference between Data warehouse and DBMS, Benefits of Data warehousing,Data mart, Meta Data, Conceptual Modeling of Data Warehouses: star schemas, Snowflake, Fact Constellations with example each.

Module II:Data Warehousing Components& Architecture
Data Warehouse Architecture, Components of Data Warehouse Architecture, Data Warehousing Topologies, Meta Data, Components of Meta data, Mapping Meta Data. Challenges with Data Warehousing.

Module III: On Line Analytical Processing (OLAP)
Definition: OLAP, Difference between OLTP and OLAP, OLAP Server Architecture, OLAP Operations, Multi Relational &Multi Dimensional: MOLAP, ROLAP, OLAP Tools, Metadata Repository, Data Warehouse Back-End Tools and Utilities.

Module IV: Data Mining : Association Rules ,Classification and Clustering
Introduction to Data Mining, Applications, Limitations, Techniques, Association Rules: Apriori Algorithm, Classification: Decision Tree
Cluster Analysis: Features, Types of Cluster Analysis Methods: Partitional, Hierarchical, Density Based, Grid based Methods, , Web Data Mining, Search Engine, Case Study, Limitations.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text & References:
Text::
- Han &Kamber)Data Mining: Concepts and Techniques, Morgan Kaufmann Publishers, March 2006
- Alex Berson, Data Warehousing, Data Mining, and Olap, Tata McGraw Hill.

References:
- George M Marakas, Modern Data Warehousing, Mining & Visualization Core Concepts, Pearson Education.
- M.H.Dunham,"DataMining:Introductory and Advanced Topics" Pearson Education.
- Jiawei Han, Micheline Kamber, "Data Mining Concepts & Techniques" Elsevier.

E-COMMERCE

Course Code:IFT2619   **Credit Units: 03**

Course Objective:
This course is aimed at incorporating the fundamentals of E-Commerce which involves study of Network Infrastructure, Mobile Commerce, Web Security, encryption, etc. which are essential components of Managing e-transactions making life even simpler and getting rid of various time consuming and tedious activities.

Course Contents:

Module I: Introduction
Traditional commerce – an overview, What is E-commerce?, Comparison between Traditional and Electronic commerce, Issues associated with electronic commerce. Types of E-Commerce: Inter Organizational E- commerce, Intra Organizational E-Commerce, Architectural frame work of E-Commerce, Benefits, Advantages and Disadvantages of E- Commerce.

Module II: Web Security
Firewalls, Types of Firewalls, Transaction Security, Cryptography: Secret Key Encryption, Public key Encryption, Implementation & management issues, Virtual Private Networks, Client Server Network Security.

Module III: E**lectronic Payment Scheme**
Limitations of Traditional Payment system, Cyber Cash, First Virtual payment schemes, Online credit card system: SET, Smart card, Electronic cheques, Digital Cash, Debit card.

Module IV: Electronic Data Interchange (EDI)
Definition of EDI, EDI in action, Types of EDI, Benefits of EDI.

Module V: E-Commerce and Market
SCM, marketing issues, Advertising and online publishing, Copyright and its protection methods

Examination Scheme:

Components	CT1	A/Q/C	ATTD.	EE
Weightage (%)	15	10	5	70

Text & References:

Text:
- Ravi Kalakota. Andrew Whinston. "Frontiers of Electronic Commerce ". Addison Wesley
References:
- Denial Amor "The E Business revolution", Addison Wesley
- Greenstein &Feinman, " Electronics Commerce", Tata McGraw Hill

MULTIMEDIA & ITS APPLICATIONS LAB

Course Code: IFT2610   **CreditUnits: 01**

Course Contents:

1. Create the animation of flying bird in flash.
2. Create the animation of walking man with his arms and legs moving.
3. Show an example of Masking in flash.
4. Make an animation of bouncing ball using flash.
5. Create the animation of moving Car in flash.
6. Make the blinking colorful text in flash.
7. Make a scenery showing rising sun in it using flash.
8. Show a flower growing in a flower pot.
9. Create the animation to show a Gardner watering the flower.
10. Make an animation to show a charismas tree growing step by step.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

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

Tool Required – Macro –Media flash.

INTRODUCTION TO OPEN SOURCE TECHNOLOGIES
(PHP, MySql) LAB

Course Code: IFT2620   **Credit Units: 01**

Course Contents:

1. Write the process of installation of web server.
2. Write programs to print all details of your php server. Use phpinfo().
3. Write a program to give demo of ECHO and PRINT command.
4. Write a program to implement the string functions.
5. Write a program to print Fibonacci series upto a given number.
6. Write a menu driven program to implement a calculator which performs only addition, subtraction, multiplication and division. The operation should happen based on user choice.
7. Write a program sort ten number by using array.
8. Write a program to demonstrate the concept of associative array.
9. Write a program to demonstrate the concept of multidimensional array.
10. Write a program to demonstrate the concept of Classes & objects.
11. Create a login form with two text fields called "login" and "password". When user enters "Amity"as a user name and "university" as a password it should be redirected to a Welcome.HTML page or toSorry.HTML in case of wrong username/password.
12. Create a database in MySql and connect that database from PHP.
13. Write a program to Update, insert and delete the values of table in database.
14. Create a form with a text box asking to enter your favorite city with a submit button when the user enters the city and clicks the submit button another php page should be opened displaying "Welcometo the city".
15. Write a program to design login form in which find the greatest number amongst three numbers.
16. WAP for Marksheet generation.
17. Design a webpage for entering the student details with all the validations applied on it.
18. Write a php script to print current date and time.
19. Write a pp script to use include and require functions.
20. Write a php script including all the file handling functions.

Examination Scheme:

IA				EE	
A	**PR**	**LR**	**V**	**PR**	**V**
5	10	10	5	35	35

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

COMPUTER ORIENTED STATISTICAL & OPTIMIZATION METHODS

Course Code: IFT2616   **Credit Units : 03**

Course Objective:
The objective of this course is to expose students to the fundamentals and concepts of statistical and optimization methods, in particular, with reference to frequency distribution and measures of central tendency, measures of dispersion, skew ness and kurtosis, theory of probability, linear programming problems, transportation, assignment and game problems.   This course is designed with an aim of helping the students to understand important theorems, different formulae and practical applications of these statistical and optimization methods in the field of Computer Sciences and Applications.

Course Contents:

Module I
Collection of Data, Sampling and Sampling Designs, Classification and Tabulation of Data, Graphical representation of Data, Measures of Central Value, Measures of Dispersion. Moments, Skewness, Kurtosis, Correlation and Regression.

Module II: Probability
Classical Definition of Probability,Algebra of Events, Probability Axoims, Conditional Probability.
Probability Distributions: Discrete and Continuous Distributions, Binomial Distribution, Poisson distribution, Normal Distribution.

Module III: Linear Programming
Mathematical Formulation of Linear Programming models and its Graphical Solutions, Simplex Method, Charne's Big M method, Two Phase Method.

Module IV: Transportation Problem
General Transportation model, Starting basic Solutions:-North west Corner Method, Least Cost Method, Vogel's Approximation Method, Test of optimality, unbalanced Problem. Assignment Problems

Module V: Game Theory
Two-Person Zero Sum Games, Maximin-Minimax Principal, Pure Strategies, Mixed Strategies, Expected Pay off, Concept of Dominence, Graphical Solution of m X 2 and 2 X n Games.

Examination Scheme:

Components	CT1	A/C/Q	Attd	EE
Weightage (%)	15	10	5	70

Text & References:
Text:
- P.K. Gupta & Manmohan, Linear Programming and Theory of Games, S Chand & Sons Educational Publishers
- S.C Gupta & V.K. Kapoor, Fundamentals of Mathematical Statistics, S Chand & Sons Educational Publishers

References:
- Hogg, Probability and Statistical Inference, Prentice Hall Publication
- Alexander. M. Mood, Introduction to the Theory of Statistics, Tata Mc Graw Hill

MAJOR PROJECT / DISSERTATION

Course Code: IFT2637   **Credit Units: 06**

Objective:
Major Project/Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology, practical skill enhancement and an opportunity to work closely with a industry external guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation. Students require 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 be allotted a supervisor** for proper guidance.
- **Student will first submit details of company, external guide, project title to coordinator/supervisor as per given schedule.**
- After project approval student will submit synopsis as per given guidelines.
- Student will maintain a file (**Internship File/Project Report**) which he/she will submit after completion of internship. **Further, coordinator will provide NTCC project guidelines and sample to help in preparation of 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 cosurse 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.

In general, the Project Report 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.

The **layout guidelines** for the Project Report

1. File should be in the following specification
- A4 size paper
- Hard Bound- Dark Green Colour

- **Font**
For normal text Font Type and Size must be- Times New Roman, 12 pt. The minimum font size of materials within a table or a figure can be 10 point.

- **Margins**

A margin of 3.75 cm (1½ inch) is to be given on the binding edge while on the other sides it is to be 2.5 cm (1 inch). The text of the report, including headings, figures, tables, and notes, but excluding page numbers, must be accommodated within the page area.

- **Line Spacing**

The line spacing in the main text must be between one-and-a-half (1.5). Single line spacing should be given for figure captions, table titles, figure legends, and footnotes. Equations, tables, figures, and quotations should be set off from the main text with adequate space (not less than the normal line spacing adopted for the main text). Two consecutive paragraphs should be separated by a spacing which must be larger than the line spacing adopted for the text.

- **Tables and Figures**

Each sketch, drawing, graph and photograph should have a figure number and title below the figure etc. Numbering should be sequential, chapter wise. For instance, if there are 24 figures chapter 3 spread over all of its sections the figure numbers run from Figure 3.1 through Figure 3.24. In figures experimental data should typically be represented by centered symbols, and theoretical data by continuous curves.

Each table should have a table number and caption above the table. Numbering should be sequential, chapter wise, as in the case of Figure numbers. For instance, if there are 18 tables in chapter 3 the table numbers run from Figure 3.1 through Figure 3.18.

Make sure that figures and tables are complete in other respects such as legends, references (if any) and coordinate labels with units. Each figure and table must be explicitly referred to in the text and located where its first reference occurs, preferably after the reference.

- **Drawings**

All engineering drawings must conform to relevant Standards and should include a title block. If drawings are large they should be included at the back of the report in a separate pocket. In case drawings are made using CAD packages, a CD ROM should be included which contains all the files and details of the packages used.

- **Equations**

The numbering of equations should be sequential, chapter wise. Numbered equations must be explicitly referred to in the text.

2. Report Size: The maximum number of pages of the Report should be preferably between 50-80 pages.

3. Report Layout: The report should contain the following components
Front Page
Declaration
Student Certificate (University)
Certificate (Company)
Acknowledgement
Abstract
Contents
List of Figures
List of Tables
Company Profile (optional)
Chapters
Appendices(optional)
References / Bibliography

The above given components are described below:

1. **The Title Page**-- Format will be given by coordinator/supervisor.
2. **Declaration by the Students-**This is page number (i), the beginning of the small case Roman numeral page numbers. The student has to give a declaration to the effect that the data used for the work, the work depicted in the report, and the written material contained in the report are not copied from others and that due permission has been taken from, and due credit has been given to, the sources whenever they are used.
3. Certificate-This is page number (ii). It is given by the Institute. The certificate will be signed by the Faculty Supervisor(s) before the viva-voce after verifying the format and by the Head of the Department after review with the Supervisor(s).
4. Company Certificate: This is a certificate, which the company gives to the students.
5. Contents-This is page number (iii). The table of Contents should be titled just Contents (not Table of Contents). Try to fit it into one or two pages.
6. Acknowledgement-This is page number (iv). Keep this brief and avoid using informal language. This page must be signed by the candidate.
7. Abstract and **Keywords-**This is page number (v). The abstract (preferably one page) should contain the context/relevance of the problem at hand, a description of what was done and a gist of the significant observations/results.
The keywords (maximum 6) are a hint that what is contained in the report.
8. Company Profile: A Company Profile corresponds to a file with company-specific data. Company data can be stored there and included in a booking when needed.
9. **Chapters**—Introduction, Literature Review/Background Study etc. as given by coordinator/supervisor.
10. **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

Continuous Internal Assessment   **Final Assessment**
          50 Marks   50 marks

Continuous Internal Assessment consists of topic relevance, synopsis, progress report and draft report. Final Assessment includes viva, presentation, report and execution marks.

Examination Scheme:

Components	S	PR1	PR2	PR3	V	E	R	FP
Weightage	20	10	10	10	10	10	15	15

S-Synopsis, PR1-Progress Report-1, PR2- Progress Report-2, PR3- Progress Report-3, V – Viva, FP – Final Presentation, R – Report, E-Execution