

Bachelor of Computer Application + Master of Computer Application (Dual Degree)

Syllabus - First Semester

COMPUTER FUNDAMENTALS AND TOOLS

Course Code: IFT6103

Credit Units: 03

Course Objective:

This course is aimed to provide a fundamental understanding of computer science for the students in their early stages of academic career. Various computer nomenclatures regarding to hardware and software will be introduced for students to develop an in-depth realization of several subjects and their significant roles in the field. After this course, you will be able to understand fundamental concepts of computer.

Course Contents:

Module I: Computer and its characteristics, application of computers, digital and analog computer, Generation of computers, Storage devices: primary storage devices (RAM,ROM,PROM,EPROM,EEPROM) , secondary storage devices(Floppy disk, Hard disk, optical disk, magnetic tapes), Input and output devices (keyboard, mouse, light pen, joystick, scanner, monitor, printers etc.)

Module II: Software and its types (System Software, Application Software, Firmware Softwares) Computer Languages and its types (Machine Language, Assembly Language, High Level Language: advantages and disadvantages of computer languages),Translators :Compiler, Linker, Interpreter . Number system and its types, conversion from one base to another and vice versa.

Module III: Word Processor and its features, Editing of Text, Find and Replace, Bullets and Numbering, Spell Checker, Grammar Checker, Auto Correct, Auto Complete, Auto Text, Header and footer, tables, mail merge, border and shading, page setup, printing.

Module IV: Spread sheet and its features, Entering Information in Worksheet, Editing Cell Entry, Moving and Copying Data, deleting or Inserting Cells, Rows and Columns, Custom Numeric Formats, Using Formulas and functions, Creating charts.

Module V: Presentation Software and its uses, steps for creating PowerPoint Presentation, PowerPoint Views, Assigning Slide Transitions, Using Preset Animations, Hiding Slides, Slide Show, Controlling the Slide Show with a Keyboard, Setting Slide Show Timings.

Examination Scheme:

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

Test & References

Text:

- P.K Sinha &Priti Sinha, Computer Fundamentals, BPB Publications.
- Peter Nortan, Introduction to Computers, Tata Mcgraw Hill.

References:

- Suresh K. Basandra, Computer Systems Today, Galgotia Publications.
- Joyce Coax , Joan Preppernau,,Steve Lambert and Curtis Frye,2007 Microsoft Office System step by step, Microsoft Press
- R.K. Taxali, PC Software for Windows, Tata Mcgraw Hill.

DIGITAL ELECTRONICS

Course Code: IFT6104

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: IFT6108

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 associativity. 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: IFT6109

Credit Units: 01

Course Contents:

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. Create 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, A- Attendance

COMPUTER PROGRAMMING WITH C LANGUAGE LAB

Course Code: IFT6110

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.

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, A- Attendance

Syllabus - Second Semester

WEB TECHNOLOGIES

Course Code: IFT6210

Credit Units: 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 | 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 & FILE STRUCTURES USING ‘C’ LANGUAGE

Course Code: IFT6202

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 program design in C”, Second Edition, 1997, Pearson education.
- S. Chottopadhyay, D. Ghoshdastidar & M. Chottopadhyay. 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

DATABASE MANAGEMENT SYSTEMS

Course Code: IFT6211

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. BoyceCodd 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: IFT6212

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 Shift 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.

ENTERPRISE RESOURCE PLANNING

Course Code: IFT6215

Credit Units: 02

Course Objective:

The objective of the course is to give an introduction to Enterprise Resource Planning, its benefits, ERP systems, Implementation Methodology, a brief on various ERP Systems available in the market & Supply Chain Management.

Course Contents:

Module I: Introduction

Definition, An overview of ERP, ERP important to a company, ERP architecture, Benefits of ERP, Risks of ERP, Benefits of ERP: Tangible and Intangible.

Related Technologies: Business Process Reengineering (BPR), Data Warehousing, Data Mining, On-line Analytical Processing (OLAP), Supply Chain Management (SCM), Management Information systems (MIS), Decision support system (DSS), Bill of Material (BOM), Product Data Management (PDM), CRM.

Module II: ERP Implementation

ERP Implementation Lifecycle, Implementation Methodology, Packages selection , Project Teams, Vendors, Consultants and Employees, Project Management , After ERP Implementation.

Module III: ERP Modules

Business Modules, Finance, Manufacturing (Production), Human Resources, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution.

Module IV: ERP Market

ERP Market Place, SAP AG, PeopleSoft, Baan Company, JD Edwards, Oracle Corporation, QAD, System Software Associates, Inc. (SSA), Future Trends in ERP.

Examination Scheme:

| Components | CT1 | A/C/Q | Attnd | EE |
|---------------|-----|-------|-------|----|
| Weightage (%) | 15 | 10 | 5 | 70 |

Text & References:

- Enterprise Systems For Management, Luvai F. Motiwalla, Jeff Thompson, Pearson Education.
- Enterprise Resource Planning, Ravi Shankar, S.Jaiswal, Galgotia Publication Pvt. Ltd.
- Enterprise Resource Planning, Alexis Leon, Tata McGraw Hill

DATA & FILE STRUCTURES USING 'C' LANGUAGE LAB

Course Code: IFT6208

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, A- Attendance

WEB TECHNOLOGIES LAB

Course Code: IFT6213

Credit Units: 01

Course Contents:

- Design a webpage to show a basic structure of html document using tags like head, title and body.
- Design a webpage to show various tags used for formatting text.
- Design a webpage to show usage of various heading tags, font tag and background color.
- Design a webpage to insert image in the background.
- Design a webpage to insert image with alignment.
- Design a webpage to show the use of link(Text & Image).
- Design a webpage to show scrolling text and scrolling image using marquee tag.
- Design a webpage to show usage of ordered list.
- Design a webpage to show usage of unordered list.
- Design a webpage to show usage of definition list.
- Design a webpage to show usage of nested list.
- Design a table with 5 rows and 5 columns.
- Design a table using rowspan, colspan, cell padding and cell spacing.
- Divide a webpage into 3 blocks using frame tag(row wise) .
- Divide a webpage into 3 blocks using frame tag(column wise) .
- 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, A- Attendance

DATABASE MANAGEMENT SYSTEM LAB

Course Code: IFT6214

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 |

- Display the names of the students who are getting a grade C in either GAME or SUPW.
- Display the number of students getting grade A in cricket.
- Display the different games offered in the school.
- Display the SUPW taken by the students, whose name starts with 'A'.
- Add a new column named 'Marks'.
- Assign a value 200 for Marks for all those who are getting grade B or above in GAME.
- 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 |

- Display the names of the students who are getting a grade C in either GAME1 or GAME2.
- Display the number of students getting grade A in cricket.
- Display the names of the students who have same game for both GAME1 and GAME2.
- Display the games taken by the students, whose name starts with 'A'.
- Add a new column named 'Marks'.
- Assign a value 200 for Marks for all those who are getting grade B or above in GAME.
- 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 13 th | 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 in 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:

- Printing the Fibonacci series from 1 to 50.
- Printing the smallest number among any three numbers.
- 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, A- Attendance

Syllabus - Third Semester

DISCRETE MATHEMATICAL STRUCTURES WITH APPLICATIONS TO CS

Course Code: IFT6311

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 , Bipartite 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's Prakashans.

MANAGEMENT INFORMATION SYSTEM

Course Code: IFT6312

Credit Units: 03

Course Objective:

This course will provide the students with an understanding of the principles of information systems technology and its impact on the strategic goals and direction of the organization. They will learn how MIS concepts are applied in business and how information systems can provide solutions to the entire organization.

Course Contents:

Module I: Introduction to MIS and Fundamentals of Information

Background, meaning, nature, characteristics, myths, requirements, problems and solutions, benefits, limitations, significance and role of management information system, Concept of information, characteristics of information, value of information, source of information, type of information, process of management.

Module II: Conceptual Framework of Information System

Concept of system, definition of system, characteristics of system, system stake holder, types of system, evolution of information system, approaches to management information system, A framework for MIS architecture, components of MIS, classification of information system.

Module III: Concept of Decision Making and MIS

Introduction, Decision Making and managers, Classification of managerial decision, Model for decision making process, MIS and Decision Making, Concept of balance, efficiency and effectiveness.

Module IV: Development, Implementation, Evaluation and Maintenance of MIS

Principles for information system development, MIS development process, methods of implementing of MIS, evaluation of MIS, structure for evaluation of MIS, maintenance, problems related to maintenance and measure to overcome these problems.

Module V: Control and Security Issues in MIS

Meaning of control, need of control, types of control, security hazards, goal of security control against hazards, security techniques.

Examination Scheme:

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

Text & References:

Text:

- Management Information System, Dharmenderkumar and Sangeeta gupta, Excel books, 1st edition.

References:

- Management Information System: managing the digital firm, Laudon & Laudon, 14th edition. (E-book is also available free)
- Simplified approach to management information system, Ravi kumar, ranjeev k chopra, Katson books, 1st edition.

OBJECT ORIENTED PROGRAMMING WITH C++

Course Code: IFT6302

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 & References:

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: IFT6304

Credit Units: 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 | 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.

FUNDAMENTALS OF SOFTWARE ENGINEERING

Course Code: IFT6313

Credit Units: 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

OBJECT ORIENTED PROGRAMMING WITH C++ LAB

Course Code: IFT6306

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 their 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 create a class student containing Name & class as parameters, create another class marks which inherits 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, A- Attendance

OPERATING SYSTEM LAB

Course Code: IFT6314

Credit Units: 01

Unix Programmes

1. Write a Shell Script that takes a search string and filename from the terminal & displays the results.
2. Write a Shell Script that takes pattern and filename as command line arguments and displays the results appropriately i.e. pattern found/pattern not found.
3. Write a Shell Script that accepts only three arguments from the command line. The first argument is the pattern string, the second argument is the filename in which the pattern is to be searched 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, print 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, A- Attendance

FUZZY LOGIC

Course Code: IFT6315

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

SUMMER INTERNSHIP EVALUATION-I

Course Code: IFT6335

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 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

Syllabus - Fourth Semester

THEORY OF COMPUTATION

Course Code: IFT6410

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 its 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, NFA 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 of Strings, Derivation Trees and Syntax Trees, Removal of (ϵ -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", Addison 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 NETWORKS

Course Code: IFT6411

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-Rject), IEEE Standards-802.3, Token Bus (802.4), Token Ring (802.5), FDDI.

Module V

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.

BASICS OF ALGORITHM

Course Code: IFT6404

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. Rajsekar, "Fundamentals 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

PRINCIPLES OF MANAGEMENT

Course Code: IFT6412

Credit Units: 03

Course Objective:

- To provide a basis of understanding to the students with reference to working of Business Organizations through the process of Management.
- To inculcate the managerial skills of planning, organizing, and controlling and to teach how it can be executed in a variety of circumstances and apply concepts of strategic and tactical organizational planning.
- On completion of the syllabi the student will understand the basic principles of management - will acquaint himself with management process, functions and principles. Student will also get the idea about new developments in management.

Course Contents:

Module I: NATURE OF MANAGEMENT

Meaning, Definition, its nature purpose, importance & Functions, Management as Art, Science & Profession- Management as social System Concepts of management-Administration-Organization, Levels of Management - Concept, Significance, Role & Skills, Concepts of PODSCORB, Managerial Grid.

Evolution of Management thoughts : Contribution of F.W Taylor, Henry Fayol and Contingency Approach.

Module II: PLANNING AND DECISION MAKING

Planning : Meaning, Importance, Elements, Process, Types and levels, Limitations

Decision Making: Meaning, Importance, Process, Techniques of Decision Making

Module III: ORGANISING

Organizing: Concepts, Structure (Formal & Informal, Line & Staff and Matrix), Meaning, Advantages and Limitations. Departmentation: Meaning, Basis and Significance, Span of Control: Meaning, Graicunas Theory, Factors affecting span of Control, Centralization vs Decentralization, Delegation: Authority & Responsibility relationship

Module IV: DIRECTING , LEADERSHIP, CO-ORDINATION AND CONTROLLING

Directing: Meaning and Process,

Leadership: Meaning, Styles and Qualities of Good Leader, Co-Ordination as an Essence of Management,

Controlling: Meaning, Process and Techniques

Module V: Recent Trends

Challenges in recent Trends : Green Management, CSR, Increasing Concern for the Environment, Greater Personalization and Customization, Faster Pace of Innovation, Increasing Complexity, Increasing Competition for Talent

Solution Trends : Becoming More Connected, Becoming More Global, Becoming More Mobile Rise of the Creative Class, Increasing Collaboration

Examination Scheme:

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

Text Books : Essential of Business Administration - K.Aswathapa Himalaya Publishing House

Books Recommended:-

- Essential of Management - Horold Koontz and ItainzWeibrich - McGrawhills International
- Management Theory & Practice - J.N.Chandan

- Principles & practice of management - Dr.L.M.Parasad, Sultan Chand & Sons - New Delhi
- Business Organization & Management - Dr. Y.K. Bhushan
- Management: Concept and Strategies By J. S. Chandan, Vikas Publishing
- Principles of Management, By Tripathi, Reddy Tata McGraw Hill
- Business organization and Management by Talloo by Tata McGraw Hill
- Business Environment and Policy – A book on Strategic Management/Corporate Planning By Francis Cherunilam Himalaya Publishing House 2001 Edition

COMPUTER NETWORKS LAB

Course Code: IFT6413

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, A- Attendance

BASICS OF ALGORITHM LAB

Course Code: IFT6414

Credit Units: 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, A- Attendance

Syllabus - Fifth Semester

COMPUTER ORIENTED NUMERICAL METHODS

Course Code: IFT6511

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 Arithmetic- Floating point numbers-operations, Normalization and their Consequences, Absolute, Relative and Percent Error.

Iterative Methods:- Zeros of a single Transcendental 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

ACCOUNTING AND FINANCIAL MANAGEMENT

Course Code: IFT6512

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

CORE JAVA PROGRAMMING

Course Code: IFT6501

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 | PR. | 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

BASICS OF COMPUTER GRAPHICS

Course Code: IFT6513

Credit Units: 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 Spraul, Tata Mc Gra Hill
- Foley "Computer Graphics" Addison Wesley
- Rogers' "Procedural Elements Of Computer Graphics " Mc-Grawhill

CORE JAVA PROGRAMMING LAB

Course Code: IFT6505

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) $\text{Energy} = \text{mass}(\text{acceleration} * \text{height} + (\text{velocity})^2 / 2)$
 - (ii) $\text{Torque} = 2m_1m_2 / m_1 + m_2 * g$
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

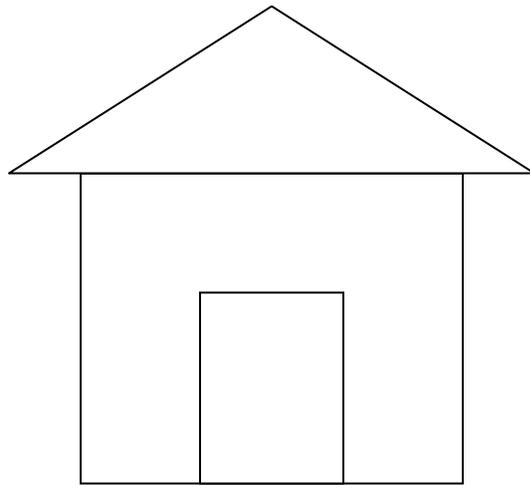
8. Write simple program to calculate the sum of digits of any number.
9. Write a simple program to display a "*" I triangle shape.

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 in 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, A- Attendance

BASICS OF COMPUTER GRAPHICS LAB

Course Code: IFT6514

Credit Units: 01

Course Contents:

- 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 $-\infty$ using midpoint algorithm.
- 12) Write a program to draw an octant of a circle with its center at point (0,0) 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 its center at point (a, b) and radius r using midpoint circle drawing.
- 15) Write a program to draw a circle with its center at point (a, b) and radius r using midpoint circle drawing.
- 16) Write a program to fill a polygon using flood-fill method.
- 17) Write a program to fill a polygon using boundary-fill method.
- 18) Write a program to reflect a point in X and Y-axis both.
- 19) Write a program to rotate a point (100, 50) about origin in anti-clock wise direction.
- 20) Write a program to rotate a point (100,150) about point (30, 40) in clock wise direction..

Examination Scheme:

| IA | | | | EE | |
|----|----|----|---|----|----|
| A | PR | LR | V | PR | V |
| 5 | 10 | 10 | 5 | 35 | 35 |

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

SYSTEM PROGRAMMING

Course Code: IFT6515 CreditUnits: 03

Course Objective:

This course is an introduction to the design and implementation of various types of system software. It is intended that the student should be able to design a working assembler, loader and macro-processor on completion of this course.

Course Contents:

Module I: Introduction

Introduction, Components of system software, Evolution of system software, Language translators, batch Monitors multiprogramming operating system, time sharing operating system, Evolution of programming system. Assembler Structure of an assembler, Design of Two pass assembler (8085 as ref), Single Pass assembler - Table of incomplete instruction, backpatching Cross-assembler.

Module II: Macro Processor

Macro instructions, Features of a macro facility, Design of two pass macro processor. Implementation of nested macros (macro call inside definition, definition inside definition).

Module III: Linkers and Loaders Schemes

Compile and Go, General loader scheme, absolute loader, and subroutine linkages, Relocating loaders, Direct linking loader, and Dynamic linking loader, overlay structure. Design of Absolute loader, direct linking loader. Implementation example - MS DOS linker.

Module IV: Compiler phases

Introduction, with Input/output for each phase, bootstrapping of compiler, Concept of cross compiler (introductory part only), Features of machine dependent and independent compilers. Types of compilers with definitions only, Interpreters.

Module V: Software Tools

Tools for program testing, structure of text editor, Text editors - screen editor, line editor, Word processors, Debug monitors.

Module VI: Operating System Structure

Operating System components, System calls, OS services File management, memory management, Device management, Process management, System calls, Process Scheduling Long term, Short term, Middle term scheduler, Interprocess communication Direct communication, Indirect communication, buffering.

Examination Scheme:

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

Text & References:

Text:

- System Software an introduction to system programming, L. Beck, AWP-1977
- Systems programming, John Donovan, McGraw Hill

References:

- Systems programming and operating system, D. M. Dhamdere: Tata McGraw Hill.
Peterson, Operating system

SUMMER INTERNSHIP EVALUATION-II

Course Code: IFT6535

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 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

Syllabus - Sixth Semester

COMPUTER ORIENTED STATISTICAL & OPTIMIZATION METHODS

Course Code: IFT6609

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, skewness 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 Axioms, 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, Charné'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 Principle, Pure Strategies, Mixed Strategies, Expected Pay off, Concept of Dominance, Graphical Solution of $m \times 2$ and $2 \times n$ 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

MULTIMEDIA & ITS APPLICATIONS

Course Code: IFT6601

Credit Units: 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 (%) | 10 | 15 | 5 | 70 |

Text & References:

- Multimedia systems John F. Koegal Buford Addison- Wesley

INTRODUCTION TO OPEN SOURCE TECHNOLOGIES (PHP, MySQL)

Course Code: IFT6611

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 oriented programming with Php, 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: Working with database

HTML Tables and Database tables, Database manipulation (Select, Insert, Update, Delete), validating User Input using Javascript.

MYSQL, Introducing MySQL; database design concepts; the Structured Query Language (SQL); communicating with a MySQL backend via the PHP, MySQL API Building Database Applications,

Module V: Working with Frameworks

Working with 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 | PR. | 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

MULTIMEDIA & ITS APPLICATIONS LAB

Course Code: IFT6605

Credit Units: 01

Course Contents:

- Create the animation of flying bird in flash.
- Create the animation of walking man with his arms and legs moving.
- Show an example of Masking in flash.
- Make an animation of bouncing ball using flash.
- Create the animation of moving Car in flash.
- Make the blinking colorful text in flash.
- Make a scenery showing rising sun in it using flash.
- Show a flower growing in a flower pot.
- Create the animation to show a Gardner watering the flower.
- 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, A- Attendance

INTRODUCTION TO OPEN SOURCE TECHNOLOGIES (PHP, MySQL) LAB

Course Code: IFT6613

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 to Sorry.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, A- Attendance

E-COMMERCE

Course Code: IFT6612

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: Electronic 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/C/Q | 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

MAJOR PROJECT

Course Code: IFT6637

Credit Units: 30

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 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.

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

50 Marks

Final Assessment

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

Syllabus - Seventh Semester

DESIGN AND ANALYSIS OF ALGORITHM

Course Code: IFT6720

Credit Units: 04

Course Objective:

This course aims to introduce the classic algorithms in various domains, and techniques for designing efficient algorithms. Upon completion of this course, students will be able to do the following:

- Analyze the asymptotic performance of algorithms.
- Write rigorous correctness proofs for algorithms.
- Demonstrate a familiarity with major algorithms and data structures.
- Apply important algorithmic design paradigms and methods of analysis.
- Synthesize efficient algorithms in common engineering design situations.

Course Contents:

Module-I Introduction: Algorithms, Analysis of Algorithms, Design of Algorithms, Complexity of Algorithms, Asymptotic Notations, Growth of function, Recurrences and their solution methods. Sorting in polynomial Time: Insertion sort, Merge sort, Heap sort, and Quick sort Sorting in Linear Time: Counting sort, Radix Sort, Bucket Sort, Medians and order statistics

Module-II Advanced Data Structures: Red Black Trees, Augmenting Data Structure, Binomial Heap, B-Tree, Fibonacci Heap, and Data Structure for Disjoint Sets, All kinds of Algorithms on these data structures, Dictionaries and priority Queues, mergeable heaps, concatenable queues

Module-III Advanced Design and Analysis Techniques: Dynamic programming, Greedy Algorithm, Backtracking, Branch-and-Bound, Amortized Analysis

Module-IV Graph Algorithms: Elementary Graph Algorithms, Breadth First Search, Depth First Search, Minimum Spanning Tree, Kruskal's Algorithms, Prim's Algorithms, Single Source Shortest Path, All pair Shortest Path, Maximum flow and Traveling Salesman Problem

Module-V Randomized Algorithms, String Matching, NP-Hard and NP-Completeness, Approximation Algorithms, Sorting Network, Matrix Operations, Polynomials and FFT, Number Theoretic Algorithms.

Examination Scheme:

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

Text & References:

Text:

- Thomas H Cormen, Charles E. Leiserson "Introduction to Algorithms", PHI Learning Private Limited, Delhi India.

References:

- Sara Baase and Allen Van Gelder, Computer Algorithms : "Introduction to Design and Analysis", Pearson Education
- Jon Kleinberg and Eva Tardos "Algorithm Design", Pearson Education
- Brassard, Robert and Bratley "Fundamental of Algorithms", PHI Learning Private Limited, Delhi India.
- Aho, "Design and Analysis of Computer Algorithms", Pearson Education.
- Horowitz and Sahani, "Fundamentals of Computer Algorithms", Galgotia Publications Pvt Ltd Delhi India.

PROGRAMMING WITH JAVA

Course Code: IFT6711

Credit Units: 03

Course Objective:

This course will introduce the essential topics of java programming predominately with the advance java programming language. Students will design and write interactive WWW pages using Java, HTML, CGI, VRML programming languages. Students will develop softwares that manipulates different forms of data such as hypertext, graphics, video, and sound using java technologies.

Course Contents:

Module I: Overview of Java

Introduction to Java, Java features, An Overview of Java, Data Types, Variables, Arrays, Operators, and Control Statements, Introducing Classes, A Closer look at Methods and Classes, Inheritance, Packages and Interfaces, Exception Handling, Multithreaded Programming, I/O, and Applets, Creating threads, implementing threads, threads priorities, suspending, stopping & resuming threads, String Handling.

Module II: Java AWT and Swings

Introducing the AWT: AWT Controls, Working with Windows, Layout Managers, and working with Swing, Event Handling Mechanism, Events, classes, sources of events, Networking, and Event Handling.

Module III: Collections and Generics

What Are Generics? A Generic Class with Two Type Parameters, The General Form of a Generic Class, Bounded Types, Creating a Generic Method, Generic Constructors, Generic Interfaces, Generic Class Hierarchies, Collections Overview, The Collection Interfaces, The Collection Classes, Accessing a Collection via an Iterator, The RandomAccess Interface

Module IV: JDBC

Overview of JDBC architecture , ODBC and JDBC Drivers, Connecting to Database with the java.sql Package, Using JDBC Terminology

Module V: JSP and Servlets

Introduction to Servlets, Servlet Life Cycle, Servlet based Applications, jdbc with servelets, session Management techniques in detail, JSP: Introduction to JSP, JSP implicit objects, JSP based Applications, Java. Net. Login & Logout Example, jdbc with jsp.

Examination Scheme:

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

Text & References:

Text:

- Patrick Naughtn and Herbert Schildt The Complete Reference, Java 2, TMH

References:

- Java 2 Unleashed (Techmedia – SAMS), Jamie Jaworski
- Developing Java Servlets (Techmedia – SAMS), James Goodwill sing Java 1.2 Special Edition (PHI), Webber

SOFTWARE ENGINEERING

Course Code: IFT6712

Credit Units: 03

Course Objective:

The basic objective of Software Engineering is to develop methods and procedures for software development that can scale up for large systems and that can be used to consistently produce high-quality software at low cost and with a small cycle time. Software Engineering is the systematic approach to the development, operation, maintenance, and retirement of software. The course provides a thorough introduction to the fundamental principles of software engineering. The organization broadly be based on the classical analysis-design-implementation framework.

Course Contents:

Module I: Introduction

Software life cycle models: Waterfall, Prototype, Evolutionary and Spiral models, Overview of Quality Standards like ISO 9001, SEI-CMM

Module II: Software Metrics and Project Planning

Size Metrics like LOC, Token Count, Function Count, Design Metrics, Data Structure Metrics, Information Flow Metrics. Cost estimation, static, Single and multivariate models, COCOMO model, Putnam Resource Allocation Model, Risk management.

Module III: Software Requirement Analysis, design and coding

Problem Analysis, Software Requirement and Specifications, Behavioural and non-behavioural requirements, Software Prototyping Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design, User Interface Design Top-down and bottom-up Structured programming, Information hiding,

Module IV: Software Reliability, Testing and Maintenance

Failure and Faults, Reliability Models: Basic Model, Logarithmic Poisson Model, Software process, Functional testing: Boundary value analysis, Equivalence class testing, Structural testing: path testing, Data flow and mutation testing, unit testing, integration and system testing, Debugging, Testing Tools, & Standards. Management of maintenance, Maintenance Process, Maintenance Models, Reverse Engineering, Software RE-engineering

Module V: UML

Introduction to UML, Use Case Diagrams, Class Diagram: State Diagram in UML Activity Diagram in UML Sequence Diagram in UML Collaboration Diagram in UML, Domain, Component Diagram and Deployment Diagram

Examination Scheme:

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

Text & References:

Text:

- K. K. Aggarwal & Yogesh Singh, "Software Engineering", 2nd Ed, New Age International, 2005.
- R. S. Pressman, "Software Engineering – A practitioner's approach", 5th Ed., McGraw Hill Int. Ed., 2001.

References:

- R. Fairley, "Software Engineering Concepts", Tata McGraw Hill, 1997.
- P. Jalote, "An Integrated approach to Software Engineering", Narosa, 1991.
- Stephen R. Schach, "Classical & Object Oriented Software Engineering", IRWIN, 1996.
- James Peter, W. Pedrycz, "Software Engineering", John Wiley & Sons.
- Sommerville, "Software Engineering", Addison Wesley, 1999.

COMPUTER GRAPHICS & MULTIMEDIA SYSTEMS

Course Code: IFT6713

Credit Units: 03

Course Objective:

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

Course Contents:

Module I: Overview of Graphics System

Application of computer graphics, Video Display Devices, Raster Scan Display, Random Scan Display, Input Devices, Graphic Software and graphics standards, Numerical based on Raster and Random scan display, Frame buffer, Display processor, picture construction technique in interactive computer graphics.

Module II: Output Primitives

Scan conversion, Points and Lines, Line-Drawing Algorithm, Circle Generation Algorithms, Ellipse Generation Algorithm, Area fill algorithms for various graphics primitives: Scan line fill algorithm, boundary fill algorithm, flood fill algorithm, Polygon representation, various method of Polygon Inside test: Even-Odd method, winding number method, Various techniques for character generation.

Module III: Two Dimensional Geometric Transformations

Basic Transformations, Composite Transformation, Translation, Rotation, Scaling, General Pivot-Point Rotation, General Fixed Point Scaling, General Scaling Directions, Reflection, Shear, Raster Methods for Transformations.

Module IV: Two-Dimensional Viewing

Window to view Port Co-ordinate Transformation, Anti aliasing and filtering techniques, Clipping Operations, Cohen Sutherland Line Clipping algorithm, Sutherland Hodgeman Polygon Clipping algorithm, fractal geometry methods, fractal dimensions, Geometric construction of deterministic self-similar fractals, Iterated function system to generate fractals.

Module V: Three Dimensional Geometric and Modeling Transformations

3D viewing: 3 dimensional viewing parameters, Homogeneous coordinate representation, Advantages and disadvantages of homogeneous coordinate system, Translation, Rotation, Scaling, Other 3D Transformations, Composite Transformation, and Projections: Parallel projections, perspective projections, and oblique projection.

Module VI: Visible- Surface Detection Methods

Bezier curves and Bezier surfaces, B-spline curves and surfaces, Overview of Visible Surface Detection Algorithm, Concept of light source, specular and diffuse reflection, Illumination through light source, Shadow and its types, Depth-Buffer Method, A Buffer Method, Scan-Line Method, Binary search partition method, painter's algorithm or depth sorting method.

Module VII: Introduction to multimedia

Elementary image processing techniques, Introduction to Animation, software used in animation, Design of animation sequence, graphics library functions used in animation design.

Examination Scheme:

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

Text & References:

Text:

- Computer Graphics, Donald Hearn, M Pauline Baker, 2nd Edition, PHI 1999
- Schaum Series, Computer Graphics

References:

- Computer Graphics, N. Krishnamurthy, TMH

BUSINESS MANAGEMENT: FRAMEWORK AND IMPLEMENTATION

Course Code: IFT6714

Credit Units: 03

Course Objective

- The basic management concepts and use of management principles in the organization will be introduced to student. Student gain understanding of the functions and responsibilities of the manager and understand Human Behaviour in organizations which improves their managerial effectiveness.
- provide the students exposure to modern marketing concepts, tools, and techniques, and help them develop abilities and skills required for the performance of marketing functions.
- The financial aspect of business and management will be taught to student through this subject. This will benefit student in understanding and analyzing financial statements of a business. Student will learn Financial Accounting
- to provide a thorough understanding of the essential characteristics and the basic tenets of research methodology and report preparation. The course will focus research methods and techniques that are essential for the validity and reliability of the research process. The course will identify and review the components essential for preparation of research proposals, research reports, business proposals and feasibility studies in order to develop report writing and formal presentation skills of the research projects undertaken

Course Contents :

Module I : Principles Of Management And Organizational Behavior

Management – Need, Scope and Process; Managerial Levels; Managerial Functions – Planning, Organizing, Staffing, Directing and Control ; Types of Managers – Functional, Specific, Line, Generic; Organization – Need, Process and Types of Organizational Structure
Organizational Behavior : Need and Importance, Johari Window

Module II : Marketing Management - Fundamentals of Marketing Philosophies of Marketing Management, Scanning the Marketing Environment, Marketing Mix Elements, Difference between marketing and Selling, The factors influencing consumer behavior, Market Segmentations, Levels of Market Segmentations,

Product Mix - Classification of products, New Product development, stages of product development product life cycle ; **Promotion Mix** - Advertising, Personal Selling, Sales Promotion and Publicity and Public Relations, Direct Marketing ; **Place Mix** - Channel functions and flows, Logistics and Distribution decisions, Types of Channel Partners ; **Price Mix** - Setting the price, adapting the price, initiating and responding the price changes

Module III : Financial Accounting - Double Entry Accounting system, Concepts and conventions in accounting, Accounting process; Journalisation : Rules for Journalisation, posting in a Ledger, subsidiary books, preparation of Trial balance; Final Accounts Preparation of Trading and profit and loss Account and Balance sheet

Module IV : Research Methodology - Objective, significance and types of research, Research Process, Identifying and Defining the Research Problem, Developing the Hypotheses, Steps to Design the Research, Sampling Design Methods and Scaling Techniques, Common sources of Error in the Field Work, Data Collection – Types and sources, Format of the Research Report

Examination Scheme:

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

Text:

- **Module 1st** :Luthans, F. (2005), Organizational Behaviour, McGraw – Hill International Edition.
- **Module 2nd** : RajanSaxena, (2010) , Marketing Management,Tata McGraw
- **Module 3rd** :Maheshwari S N and S K Maheshwari (2006), Accounting for Management, Vikas Pub. House
- **Module 4th**: Kothari C R, (1990) Research Methodology: Methods & Techniques, Vikas Publishing House Pvt.Ltd., 1978.

References:

- Kotler, Keller, Koshy, Jha, (2008), Marketing Management– A South Asian Perspective, Pearson India Pvt.
- Kurtz, (2008) Principles of Marketing, Cengage Learning, India,
- S. Neelamegham, (2009), Marketing In India,Vikas publishing house,
- Cooper, Donald R and Schindler, Ramela (2000) Business Research Methods, Tata Mc Graw Hill
- Srivastava, Shenoy and Sharma (2002)., Quantitative Techniques for Business Decisions, 4th Ed , Allied Publishers
- Dr .S. Shajahan (2004) , Research Methods for Management 2nd Edition, Jaico Publishers

DATA COMMUNICATION AND COMPUTER NETWORKS

Course Code: IFT6715

Credit Units: 03

Course Objective:

Upon successful completion of the course, the student will be knowledgeable of basic data communication and networking concepts. The course aims at providing the basic understanding of various components, models and protocols used in networking. It also emphasizes on data communication essentials including signals, encoding and multiplexing techniques.

Course Contents:

Module I: Introduction to Computer Networks

Computer Network, Advantages and Disadvantages of Computer Network, Communication system, Classification of networks, Network models- OSI model, Layers in OSI model, TCP/IP protocol suite, Transmission mode, LAN Architecture, LAN topologies-Bus, Tree, Ring, Star, Mesh, Wireless LAN, Transmission Media- Twisted pair cable, Coaxial cable, Optical Fiber, Wireless transmission media.

Module II: Data Communication

Data Transmission: Analog and Digital Signals, Periodic and Aperiodic Signals, Transmission impairments, Data rate limits-noiseless channel and noisy channel, Performance characteristics.

Data Encoding: Digital data-digital signals, Digital data-Analog signals, Analog data- Digital signals, Analog data- Analog signals.

Multiplexing: Frequency Division Multiplexing, Wavelength Division Multiplexing, Synchronous Time Division Multiplexing, Statistical Time Division Multiplexing.

Spread Spectrum: Frequency Hopping Spread Spectrum (FHSS), Direct Sequence Spread Spectrum (DSSS).

Module III: Data Link Layer

Switching- Circuit switching Vs Packet Switching, Virtual Circuits- Permanent Virtual Circuit Vs Switched Virtual Circuit, Frame Relay, ATM, Error Detection and Correction, Flow Control- Stop and Wait, Sliding Window, Error Detection, Error Control, HDLC,PPP

Module IV: Network Layer

Routers, Routing Algorithms-Unicast routing algorithms-Distance vector routing, Link state routing, Path vector routing, multicast routing algorithms, Logical addressing- IPv4, IPv6, transition from IPv4 to IPv6, Address mapping, ICMP, IGMP.

Module V: Transport layer

Transport Services, TCP, UDP, SCTP, Congestion control, Quality of Service (QoS).

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 ALGORITHMS LAB

Course Code: IFT6721

Credit Units: 01

Lab assignment will be based on the following:

- Programs sorting algorithms based on divide and conquer technique.
- Program for Counting sort, Radix Sort, Bucket Sort.
- Programs on algorithm based on greedy method.
- Programs on algorithm based on Dynamic programming.
- Programs on Graph Algorithms.
- Programs on algorithm based on backtracking.
- Programs on algorithms for string matching.

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, A- Attendance

PROGRAMMING WITH JAVA LAB

Course Code: IFT6716

Credit Units: 02

Course Contents:

1. Assume that a bank maintains two kinds of account for its customers, one called saving and other current. The saving account provides compound interest and withdrawal facilities but not cheque book. The current account provides cheque book but no interest. Current account holders should also maintain a min balance & if the balance falls below, a service charge is imposed. Create a class Account that stores customer name, account number & type of account. From this derive the classes Curr-acc&Sav-acc to make them more specific to their requirements. Include the necessary methods in order to achieve the following tasks:
 - a) Accept deposit from a customer and update the balance
 - b) Display the balance.
 - c) Compute and deposit interest
 - d) Permit withdrawal and update the balance.
 - e) Check for the minimum balance, impose penalty. If necessary, and update the balance
2. Write a Java Program to read marks out of 100 declare result as follows:
 - a. 60 or more 1st class
 - b. 50-59 2nd class
 - c. 40-49 pass
 - d. Less than 40 fail
3. Write a Java Program to read string from console and display the number of occurrence of each word
4. Write a Java Program to demonstrate use of Inheritance through vehicle, two wheeler, four wheeler and three-wheeler class.
5. Write a Java Program to demonstrate runtime polymorphism with the help of abstract classes and interfaces.
6. Write a Java Program to demonstrate how we can make sure that the main thread gets executed after the child threads finishes.
7. Write a Java Program to demonstrate the Applet Life Cycle.
8. Write a Java Program to demonstrate a working chat applet (Create both server and client).
9. Create an applet that will have a text area and a Frame. When any mouse event occurs on the frame, make an entry of that event into the text area. For example, add "Mouse Dragged" when the mouse is dragged.
10. Create an applet with Border Layout, with a button in each of the border layout component.
11. WAP to display label on a frame with the help of JFrame
12. WAP to display six buttons on a panel using JFrame.
13. WAP. To display an image and a string in a label on the JFrame.
14. WAP that implements a JApplet that displays a simple label
15. WAP that implements a JApplet and displays the following frame
 - a. Customer name
 - b. Customer number
 - c. Age
 - d. Address
16. WAP to access a table Product Master from MS-Access using Java code.
17. WAP that implements a simple servlet program.
18. WAP for authentication, which validates the login-id and password by the servlet code.
19. WAP to connect a database using user-id and password.
20. WAP to insert data into the database using the prepared statement.
21. WAP to read data from the database using the ResultSet.
22. WAP to read data sent by the client (HTML page) using servlet.
23. WAP to include a HTML page into a JSP page.
24. WAP to handle the JSPEException.
25. WAP to read data sent by a client (HTML page) using JSP.

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, A- Attendance

SOFTWARE ENGINEERING LAB

Course Code: IFT6717

Credit Units: 01

Software Required: Rational Rose

Assignments will be provided for the following:

- Use of Rational Rose for visual modeling.
- Creating various UML diagrams such as use case, sequence, collaboration, activity, state diagram, and class diagrams.

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, A- Attendance

COMPUTER GRAPHICS & MULTIMEDIA SYSTEMS LAB

Course Code: IFT6718

Credit Units: 01

Software Required: Turbo C++

Course Contents:

Assignments will be provided for the following:

- Geometrical shapes based on graphics algorithms
- 2D Geometric transformation translation, rotation, scaling, reflection.
- Clipping
- Animation

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, A- Attendance

DATA COMMUNICATION AND COMPUTER NETWORKS LAB

Course Code: IFT6719

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:

- Drawing an Enterprise Network for Amity University showing its different campuses across the country. Configuring all the devices (PCs, Servers, Switches) to create a LAN within campuses of the Enterprise Network.
- Configuring Virtual LANs (VLANs) in an Enterprise Network.
- Configuring Trunking and Inter-VLAN Routing in an Enterprise Network.
- Implementing RIP (Routing Information Protocol) to enable communication between different LANs
- Implementing OSPF (Open Shortest Path First) to enable communication between different LANs.
- Implement EIGRP (Interior Routing Protocol) to establish connectivity within domestic campuses of the Enterprise Network.
- Implement BGP (Border Gateway Protocol) and Redistribution to establish connectivity between different campuses of the Enterprise Network.
- Configuring WAN connectivity using protocols-HDLC and PPP.
- Implementing Frame-Relay to configure WAN service provider cloud.
- Configuring Standard and Extended ACLs on a Router.
- 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, A- Attendance

SUMMER INTERNSHIP EVALUATION-III

Course Code: IFT6735

Credit Units: 05

Guidelines:

There are certain phases of every Intern's professional development that cannot be effectively taught in the academic environment. These facets can only be learned through direct, on-the-job experience working with successful professionals and experts in the field. The internship program can best be described as an attempt to institutionalize efforts to bridge the gap between the professional world and the academic institutions. Entire effort in internship is in terms of extending the program of education and evaluation beyond the classroom of a university or institution. The educational process in the internship course seeks out and focuses attention on many latent attributes, which do not surface in the normal classroom situations. These attributes are intellectual ability, professional judgment and decision-making ability, inter-disciplinary approach, skills for data handling, ability in written and oral presentation, sense of responsibility etc.

In order to achieve these objectives:

- **Each student will be allotted a supervisor** for proper guidance.
- **Student will first submit synopsis in the format given by coordinator/supervisor.**
- Student will maintain a file (**Internship File/Project Report**). **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
- **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
Table of Content
Acknowledgement
Student Certificate
Company Profile (optional)
Introduction
Main Body
References / Bibliography

The File will include *five sections* in the order described below. The content and comprehensiveness of the main body and appendices of the report should include the following:

1. **The Title Page**--Title - An Internship Experience Report For (Your Name), name of internship organization, name of the Supervisor/Guide and his/her designation, date started and completed, and number of credits for which the report is submitted.

2. **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). 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. **Acknowledgements**--This is page number (iii). Keep this brief and avoid using informal language. This page must be signed by the candidate.

5. **Abstract and Keywords**--This is page number (iv). 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.

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

8. **Introduction**--short, but should include how and why you obtained the internship experience position and the relationship it has to your professional and career goals.

9. **Main Body**--should include but not be limited to daily tasks performed. Major projects contributed to, dates, hours on task, observations and feelings, meetings attended and their purposes, listing of tools and materials and their suppliers, and photographs if possible of projects, buildings and co-workers.

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

60 Marks

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

Examination Scheme:

| Components | V | S | R | PR | FP |
|----------------------|----------|----------|----------|-----------|-----------|
| Weightage (%) | 20 | 20 | 20 | 20 | 20 |

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

Syllabus - Eighth Semester

PROGRAMMING WITH C#.NET

Course Code: IFT6810

Credit Units: 04

Course Objective:

Objective of this course is to develop, well-documented programs using the C# programming language, learn object-oriented programs using C# classes and objects and to use Windows Forms to develop GUI-based programs.

Course Contents:

Module-I .NET Framework

Overview of .NET and .NET Framework,.NET Framework Architecture,.NET Compliant Languages, Common Language Specification (CLS),Common Type System (CTS),Framework Class Library (FCL),Base Class Library (BCL),Common Language Runtime (CLR),Visual Studio IDE, Microsoft Intermediate Language (MSIL),Understanding CLR and Execution of .NET Application, Components of CLR.

Module-II C#.NET Basics

Conceptual Overview of C#.Net, Visual Studio, C# Programming Language Features, Hello World Program, General Structure of a C# Program, Conceptual Overview of C#.Net,What is Visual Studio?,C# Programming Language Features, Hello World Program,General Structure of a C# Program, Data Types, Modifiers (Access Modifiers),Casting and Type Conversion, Boxing and Unboxing Modifiers (Access Modifiers), Casting and Type Conversion, Boxing and Unboxing.

Selection Statements, Looping Statement, Array- Single Dimensional and Multi-Dimensional, Declaring Arrays, Initializing Arrays, Accessing Array Members, Arrays are Objects, Using for each with Arrays, Jagged Arrays

Class, Interfaces: Defining and Implementing Single & Multiple Interfaces, Abstract Class, Reflection, Assembly, Types of Assemblies, Components of Assemblies.

Module-III Collections, Exceptions and Delegate

Non-Generic Collection: Array List, Stack, Queue, Hash Table. Generic Collection: List, Dictionary, Queue, Stack.

Exception Handling in C#, Try...Catch...Finally keywords, Using Single, Multiple and Catch All Block, Using Custom Exception

Module-IV Windows Forms

Create and populate Windows Forms, controls in a Windows Forms application, Menus in a Windows Forms application, Multiple Document Interface (MDI) applications, User input validation in a Windows Forms application

Module-V ADO.NET

ADO.NET Overview, Architecture of ADO.NET: Connected, Disconnected, Sql Connection class, Sql Command class, Data Reader class, Sql Data Adapter class, Data Set class, Data grid view with DML Operations like sorting, paging etc.

Examination Scheme:

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

Text Book:

- Herbert Schildt: Complete Reference C#, TMH Publication
- Programming in C#.NET, 3E, Tata McGraw-Hill Education,

References:

- Professional C#, Wiley Publishing, Inc.

SOFTWARE PROJECT MANAGEMENT

Course Code: IFT6811

Credit Units: 04

Course Objective:

This course introduces the concepts to understand the fundamental principles of Software Project management & provides a good knowledge of responsibilities of project manager and how to handle these. It also discusses the different methods and techniques/tools used for project management.

Course Contents:

Module-I: Introduction to Software Project Management:

Definition of a Software Project (SP), SP Vs. other types of projects activities covered by SPM, categorizing SPs, project as a system, management control, requirement specification, information and control in organization.

Module-II: Stepwise Project planning:

Introduction, selecting a project, identifying project scope and objectives, identifying project infrastructure, analyzing project characteristics, identifying project products and activities, estimate efforts each activity, identifying activity risk, allocate resources, review/ publicize plan.

Module-III: Project Evaluation & Estimation:

Cost benefit analysis, cash flow forecasting, cost benefit evaluation techniques, risk evaluation. Selection of an appropriate project report; Choosing technologies, choice of process model, structured methods, rapid application development, water fall-, V-process-, spiral- models, Prototyping, delivery. Albrecht function point analysis.

Module-IV: Activity planning & Risk Management:

Objectives of activity planning, project schedule, projects and activities, sequencing and scheduling activities, network planning model, representation of lagged activities, adding the time dimension, backward and forward pass, identifying critical path, activity throat, shortening project , precedence networks. **Risk Management:** Introduction, the nature of risk, managing risk, risk identification, risk analysis, reducing the risks, evaluating risks to the schedule, calculating the z values.

Module-V: Resource allocation & Monitoring the control:

Introduction, the nature of resources, identifying resource requirements, scheduling resources creating critical paths, counting the cost, being specific, publishing the resource schedule, cost schedules, the scheduling sequence. **Monitoring the control:** Introduction, creating the frame work, collecting the data, visualizing progress, cost monitoring, earned value, prioritizing monitoring, getting the project back to target, and change control.

Module-VI: Software quality:

Introduction, the place of software quality in project planning, the importance of software quality, defining software quality, ISO 9126, Practical software quality measures, product versus process quality management, external standards, techniques to help enhance software quality.

Examination Scheme:

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

Text & Reference Books:

Text

- Software Project Management (2nd Edition), by Bob Hughes and Mike Cotterell, 1999, TMH

References

- Software Engineering – A Practitioner’s approach, Roger S. Pressman (5thedi), 2001, MGH
- Software Project Management, Walker Royce, 1998, Addison Wesley.

ARTIFICIAL INTELLIGENCE

Course Code: IFT6812

Credit Units: 04

Course Objective:

To acquaint the student with the basic programs in the field and their underlying theory. Students will explore this through problem-solving paradigms, logic and theorem proving, language and image understanding, search and control methods and learning.

Course Contents:

Module I: Problem solving and Scope of AI

Introduction to Artificial Intelligence. AI-Applications- Games, theorem proving, natural language processing (NLP), vision and speech processing, robotics, expert systems. Solving Problems by Searching, beyond classical search, adversarial Search, constraint satisfaction problems

Module II: Knowledge and Representation

Logical Agents, First-Order Logic, Inference in First-Order Logic, Classical Planning, Planning and Acting in the Real World, Knowledge Representation.

Uncertain Knowledge and Reasoning- Quantifying Uncertainty, Probabilistic Reasoning , Probabilistic Reasoning over Time , Making Simple Decisions, Making Complex Decisions.

Module III:

Expert System: Need and justification for expert systems, knowledge acquisition, Case studies: MYCIN, RI.

Learning:- Learning from Examples, Knowledge in Learning, Learning Probabilistic Models, Reinforcement Learning.

Module IV: Communicating, Perceiving, and Acting

NLP-Natural Language Processing, Natural Language for Communication, Perception.

Robotics:- Fundamentals of Robotics, Sensors and vision system, Robot Programming languages & systems

Examination Scheme:

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

Text & References:

Text

- Stuart Russell, Peter Norvig “Artificial Intelligence: A Modern Approach” Published by Pearson,
- E. Rich and K. Knight, “Artificial intelligence”, Published by Tata McGraw-Hill Education

References:

- D.W. Patterson, “Introduction to AI and Expert Systems”, PHI, 1992.
- Peter Jackson, “Introduction to Expert Systems”, AWP, M.A., 1992.
- R.J. Schalkoff, “Artificial Intelligence - an Engineering Approach”, McGraw Hill Int. Ed., Singapore, 1992.

MOBILE COMPUTING

Course Code: IFT6813

Credit Units: 03

Course Objective:

The objective of this consortium is to shape and expand a full-scale and sound mobile computing system market. To achieve this, cooperation is required of interests related to communication (network), computer hardware/software, system integrators (including service providers), and the media.

Course Contents:

Module I: Introduction

The Cellular Engineering Fundamentals: Introduction, Cell, 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, Co-channel Interference (CCI), Adjacent Channel Interference (ACI), Cell Splitting, Sectoring, Microcell Zone concept, Repeaters, Trunked Radio System, History of Mobile phone generations, 1G technology, AMPS, TACS, NMT, C-450.

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, PDC, GPRS (2.5G), GPRS Architecture, GPRS Network Nodes, Protocol Stack, (2.75G) EDGE.

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 Medium Access Control: Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

Mobile IP, Motivation, Problems, Data Transfer, Encapsulation and tunneling, DHCP, Security.

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), TD-SCDMA and CDMA 2000, Quality of services in 3G, HSPA, HSPA+, Evolved EDGE, MIMO and DECT, 3.5G and 3.75G.

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: Fourth Generation (4G) Mobile Technologies and Current Trends

4G standard: IMT Advanced requirements, LTE Advanced, 3GPP Long Term Evolution, LTE network and Protocol Architecture, Mobile IPV6 (MIPv6), WiMax standard IEEE 802.16, OFDMA technology, VoIP, VoLTE, HSCSD, Presence Aware Technology, Pervasive Networks, Cognitive Radio, Vertical Handover, NFC (Near Field Communication)

Overview into 5G, IoT, NGMNA, Visible Light Communications (VLC) and LiFi.

Examination Scheme:

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

Text & References:***Text:***

- J. Schiller, “Mobile Communications”, Pearson Education
- Shahid K. Diddiqui, “Roaming in Wireless Networks”, McGraw Hill Professional.
- William Stallings, “Wireless Communications & Networks 2/E”, Pearson.
- Arunabha Ghosh, Jun Zhang, Jeffrey G. Andrews, Rias Muhamed, “Fundamentals of LTE”, Princeton Hall, First Edition
- “Wireless and Mobile Networks Architectures”, by Yi-Bing Lin & Imrich Chlamtac, John Wiley & Sons, 2001.
- “Mobile and Personal Communication systems and services”, by Raj Pandya, Prentice Hall of India, 2001.

References:

- “Guide to Designing and Implementing wireless LANs”, by Mark Ciampa, Thomson learning, Vikas Publishing House, 2001.
- Afif Osseiran, Jose F. Monserrat, Patrick Marsch, “5G Mobile and Wireless Communications Technology”, Cambridge University Press, October 2016
- “Wireless Web Development”, Ray Rischpater, Springer Publishing, 2000.
- “The Wireless Application Protocol”, by Sandeep Singhal, Pearson Education Asia, 2000.
- “Third Generation Mobile Telecommunication systems”, by P. Stavronlakis, Springer Publishers, 2001.

PROGRAMMING WITH C#.NET LAB

Course Code: IFT6814

Credit Units: 02

Course Contents :

1. Write a program to sort an array of n strings in ascending order.
2. Define a class student with MarksofCS, MarksofJava, MarksofDBMS, name as its data member. Enter the marks, find average and percentage for that. Use appropriate properties.
3. Define a class 'Number' and define overloaded method add () with one, two and three arguments to implement method overloading.
4. Write a program to count total no. of live objects of a class.
5. Define a class with two datamembers: num1 as constant and num2 as readonly. Display the values of both on the console and state the difference between them.
6. Create a class Student and inherit two classes UgStudent and Pgstudent from it to illustrate the concept of inheritance. Use appropriate data members, constructors, methods and properties.
7. Create a class ComplexNumber with two data members real and imaginary. Overload + and – operators for it.
8. Write a program to implement the concept of dynamic binding using appropriate classes.
9. Write a program to find out square root of number. Handel all exceptions that may occur in this program.
10. Implement the concept of the Indexer using a class 'Days' whose object can be used like an array with day as subscript.
11. Create a generic class with an array of n elements. Write the method to find out greatest and average of elements of array.
12. Write a program to store the City name and its temperature. Access the temperature using city name. Use appropriate collection.
13. Design a calculator and implement its operations.
14. Write a program to move the contents of a list box to another list box. Also write code to add and delete elements from any list box.
15. Create a database table and design appropriate form for it. Implement basic operations like insert, delete and update using ADO.NET.

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, A- Attendance

SOFTWARE PROJECT MANAGEMENT LAB

Course Code: IFT6815

Credit Units: 01

Course Contents:

Software Required: MS-Project

Lab Assignments

1. Create a MS Project application, set the file properties, and set the Project Calendar.
2. Using project planning activities, draw the PERT for the project.
3. Draw the Gantt charts for the software project.
4. Using the SPM – manage, plan and organize the project.
5. Using MS project, plan and organize the software and split the task.
6. Using MS Project Link, Move and copy tasks in Software Project
7. Draw the checkpoints and milestones of a project
8. Using MS Project do the time estimation of tasks and Set task dependencies & constraints.
9. Using MS Project assign the resources and set the notes for resources.
10. Using MS Project workspace base line the project and review the critical path

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, A- Attendance

ARTIFICIAL INTELLIGENCE LAB

Course Code: IFT6816

Credit Units: 01

Course Contents:

Assignments will be provided for the following:

- Programming in LISP
- Programming in Prolog
- Programming for Robotics

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, A- Attendance

ANDROID PROGRAMMING

Course Code: IFT6817

Credit Units: 03

Course Objective:

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

Course Contents:

MODULE-I: Introduction to Android

Introduction to Android Platform, Android Stack Android Versions and Installing Android SDK and updating SDK components, Eclipse, IDEs and ADT plug-in Using the Emulator, Android vs. Other mobile platforms **Your First Android Application:** Application Life Cycle, Application Components, Activity life cycle, Manifest File, Layout XML Code Strings, The R File, Java Source Code, Java based layout vs. xml based layout Eclipse Visual Layout Editor, Logging.

MODULE-II: UI Design for Android

Using different layouts – LinearLayout, TableLayout and others, Drawable Resources Resolution and density independence, Working with common widgets, Working with ListView and Adapters, Creating and using option menu, Working with preferences Working with Dialogs and Toasts, Working with Graphics and Animation, Intents ,Intent filters, Invoking activities by class name and URI, Sharing data using Extras Bundle and URI parameters,Working with Tabs and Fragments,

MODULE-III: Files, Database & Working in Background

Using File System, Introducing SQLite on Android, Database Connectivity, Cursors and content values, Using ContentProvider to share data,Understanding Security model, Introducing Service and its life cycle,Creating and starting a service, Types of services, Working with multi-threading and AsyncTask,Broadcastreceivers,Triggering receivers with intents,Responding to system events using Broadcast receivers,Using Alarm.

MODULE-IV: Using System Services and Web Services

Using Location based Services,Telephony and SMS services,Bluetooth, Network and WiFi, Multimedia and Camera,Accessing Internet and Web Services from Android Applications.

MODULE-V: Project

Understanding the requirement, Designing the interface and architecture, Best practices regarding application design and development, Writing code and testing it, Preparing application for Publishing, Publishing to Play Store and Physical device.

Examination Scheme:

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

Text Books:

- Android Programming THE BIG NERD RANCH GUIDE By Bill Phillips & Brian Hardy, Big Nerd Ranch, Inc.
- Head First Android Development, By Anthony J.F. Griffiths and David Griffiths,Oreilly

References Books:

- Android Programming for Beginners, By John Horton,Packt Publishing

ANDROID PROGRAMMING LAB

Course Code: IFT6818

Credit Units: 01

Course Contents:

1. Hello world program using android
2. Program to demonstrate Activity life cycle of android.
3. Working with different layouts – LinearLayout, TableLayout and others,
4. programs related to Drawable Resources.
5. Working with common widgets
6. Working with ListView and Adapters, Creating and using option menu, Working with preferences
7. Working with Dialogs and Toasts,
8. Working with Graphics and Animation, Intents ,Intent filters,
9. Invoking activities by class name and URI,
10. Sharing data using Extras Bundle and URI parameters,Working with Tabs and Fragments,
11. Database programming in android
12. Program related to Service and its life cycle
13. Program Using Alarm.
14. Programs Using Location based Services,Telephony and SMS services,Bluetooth, Network and WiFi,
15. Programs related to Multimedia and Camera,
16. Programs related to Accessing Internet and Web Services from Android Applications.

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, A- Attendance

PYTHON PROGRAMMING

Course Code: IFT6819

Credit Units: 03

Course Contents:

Module-I

installing Python; basic syntax, interactive shell, editing, saving, and running a script. The concept of data types; variables, assignments; immutable variables; numerical types; arithmetic operators and expressions; comments in the program; understanding error messages Conditions, boolean logic, logical operators; ranges; Control statements: if-else, loops (for, while); short-circuit (lazy) evaluation

Module-II

Strings and text files; manipulating files and directories, os and sys modules; text files: reading/writing text and numbers from/to a file; creating and reading a formatted file (csv or tab-separated). String manipulations: subscript operator, indexing, slicing a string; strings and number system: converting strings to numbers and vice versa. Binary, octal, hexadecimal numbers

Module-III

Lists, tuples, and dictionaries; basic list operators, replacing, inserting, removing an element; searching and sorting lists; dictionary literals, adding and removing keys, accessing and replacing values; traversing dictionaries. Design with functions: hiding redundancy, complexity; arguments and return values; formal vs actual arguments, named arguments. Program structure and design. Recursive functions.

Module-IV

Simple Graphics and Image Processing: "turtle" module; simple 2d drawing - colors, shapes; digital images, image file formats, image processing Simple image manipulations with 'image' module (convert to bw, greyscale, blur, etc). Classes and OOP: classes, objects, attributes and methods; defining classes; design with classes, data modeling; persistent storage of objects OOP, continued: inheritance, polymorphism, operator overloading (_eq_, _str_, etc); abstract classes; exception handling, try block

Module V

Graphical user interfaces; event-driven programming paradigm; tkinter module, creating simple GUI; buttons, labels, entry fields, dialogs; widget attributes - sizes, fonts, colors layouts, nested frames Multithreading, Networks, and Client/Server Programming; introduction to HTML, interacting with remote HTML server, running html-based queries, downloading pages; CGI programming, programming a simple CGI form. Searching, Sorting, and Complexity Analysis.

Examination Scheme:

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

Text Books:

- Fundamentals of Python: First Programs By Kenneth Lambert, Course Technology, Cengage Learning
- Learning Python by David Ascher and Mark Lutz, Oreilly
- Core Python Programming by Wesley Chun, Prentice Hall

PYTHON PROGRAMMING LAB

Course Code: IFT6820

Credit Units: 01

Course Contents:

- Setting up python on Windows/Linux/Mac
- First program in python.
- Programs related to basic input/output.
- Programs related to variables, strings, numbers
- Programs related to Lists and Tuples
- Programs related to Functions
- Programs related to If Statements
- Programs related to While Loops and Input
- Programs related to Basic Terminal Apps
- Programs related to Dictionaries
- Programs related to Classes
- Programs related to Exceptions
- Programs related to GUI programming

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, A- Attendance

DIGITAL IMAGE PROCESSING

Course Code: IFT6821

Credit Units: 03

Course Objective:

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

Course Contents:

Module I: Introduction and Digital Image Fundamentals

The origins of Digital Image Processing, Examples of Fields that Use Digital Image Processing, Fundamentals Steps in Image Processing, Elements of Digital Image Processing Systems, Image Sampling and Quantization, Some basic relationships like Neighbours, Connectivity, Distance Measures between pixels, Linear and Non Linear Operations.

Module II: Image Enhancement in the Spatial Domain

Some basic Gray Level Transformations, Histogram Processing, Enhancement Using Arithmetic and Logic operations, Basics of Spatial Filters, Smoothing and Sharpening Spatial Filters, Combining Spatial Enhancement Methods.

Module III: Image Enhancement in the Frequency Domain:

Introduction to Fourier Transform and the frequency Domain, Smoothing and Sharpening Frequency Domain Filters, Homomorphic Filtering.

Image Restoration

A model of The Image Degradation / Restoration Process, Noise Models, Restoration in the presence of Noise Only Spatial Filtering, Periodic Noise Reduction by Frequency Domain Filtering, Linear Position-Invariant Degradations, Estimation of Degradation Function, Inverse filtering, Wiener filtering, Constrained Least Square Filtering, Geometric Mean Filter, Geometric Transformations.

Module IV: Image Compression

Coding, Interpixel and Psychovisual Redundancy, Image Compression models, Elements of Information Theory, Error free comparison, Lossy compression, Image compression standards.

Image Segmentation

Detection of Discontinuities, Edge linking and boundary detection, Threshold, Region Oriented Segmentation, Motion based segmentation.

Module V: Representation and Description

Representation, Boundary Descriptors, Regional Descriptors, Use of Principal Components for Description, Introduction to Morphology, Some basic Morphological Algorithms.

Object Recognition

Patterns and Pattern Classes, Decision-Theoretic Methods, Structural Methods.

Examination Scheme:

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

Text & References:

Text:

- Rafael C. Gonzalez & Richard E. Woods, "Digital Image Processing", 2nd edition, Pearson Education.
- A. K. Jain, "Fundamental of Digital Image Processing", PHI.

References:

- RosefieldKak, "Digital Picture Processing",
- W.K. Pratt, "Digital Image Processing",

DIGITAL IMAGE PROCESSING LAB

Course Code: IFT6822

Credit Units: 01

Software Required:Java

List of Assignments:

Experiments will be based on Image Representation, Image transformation, Image Enhancements, Edge Detection, Morphological Image processing and Segmentation.

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, A- Attendance

TERM PAPER

Course Code: IFT6831

Credit Units: 03

Course Objectives:

- To increase the knowledge and the understanding of a particular phenomenon/topic.
- To introduce student about how to write technical papers/research papers.
- It trains the students to make use of research tools and material available both in print and digital formats.

A **term paper** is primarily a record of intelligent reading in several sources on a particular subject. The students will choose the topic at the beginning of the session in consultation with the faculty assigned. The progress of the paper will be monitored regularly by the faculty. At the end of the semester the detailed paper on the topic will be submitted to the faculty assigned. Format for term paper will be given by course coordinator/supervisor. The evaluation will be done by NTCC Board of examiners comprising of the faculties.

GUIDELINES FOR TERM PAPER

Length of paper: The paper should be type-written, font size 12pt, 1.5 spaced and between 12 and 15 pages in length. The specifications can be changed by NTCC committee from time to time. Final submission of term paper should be spiral bind.

The procedure for writing a term paper may consist of the following steps:

1. Choosing a subject
2. Finding sources of materials
3. Collecting the notes
4. Outlining the paper
5. Writing the first draft
6. Editing & preparing the final paper

1. Choosing a Subject

The subject chosen should not be too general.

2. Finding Sources of Materials

- a) The material sources should be not more than 10 years old unless the nature of the paper is such that it involves examining older writings from a historical point of view.
- b) Begin by making a list of subject-headings under which you might expect the subject to be listed.
- c) The sources could be books and magazine articles, news stories, periodicals, scientific journals etc.

3. Collecting the Notes

Skim through sources, locating the useful material, then make good notes of it, including quotes and information for footnotes.

- a) Get facts, not just opinions. Compare the facts with author's conclusion.
- b) In research studies, notice the methods and procedures, results & conclusions.
- c) Check cross references.

4. Outlining the paper

- a) Review notes to find main sub-divisions of the subject.
- b) Sort the collected material again under each main division to find sub-sections for outline so that it begins to look more coherent and takes on a definite structure. If it does not, try going back and sorting again for main divisions, to see if another general pattern is possible.

5. Writing the first draft

Write the paper around the outline, being sure that you indicate in the first part of the paper what its purpose is. You may follow the following:

- a) statement of purpose
- b) main body of the paper
- c) statement of summary and conclusion

Avoid short, bumpy sentences and long straggling sentences with more than one main idea.

6. Editing & Preparing the final Paper
 - a) Before writing a term paper, you should ensure you have a question which you attempt to answer in your paper. This question should be kept in mind throughout the paper. Include only information/ details/ analyses of relevance to the question at hand. Sometimes, the relevance of a particular section may be clear to you but not to your readers. To avoid this, ensure you briefly explain the relevance of every section.
 - b) Read the paper to ensure that the language is not awkward, and that it "flows" properly.
 - c) Check for proper spelling, phrasing and sentence construction.
 - d) Check for proper form on footnotes, quotes, and punctuation.
 - e) Check to see that quotations serve one of the following purposes:
 - (i) Show evidence of what an author has said.
 - (ii) Avoid misrepresentation through restatement.
 - (iii) Save unnecessary writing when ideas have been well expressed by the original author.
 - f) Check for proper form on tables and graphs. Be certain that any table or graph is self-explanatory.

Term papers should be composed of the following sections:

- 1) Title page
- 2) Table of contents
- 3) Introduction
- 4) Literature Review/Background Study
- 5) Methodology/Description of Topic
- 6) Discussion&Conclusion
- 7) References
- 8) Appendix

Generally, the introduction, discussion, conclusion and bibliography part should account for a third of the paper and the review part should be two thirds of the paper.

Discussion

The discussion section either follows the results or may alternatively be integrated in the results section. The section should consist of a discussion of the results of the study focusing on the question posed in the research paper.

Conclusion

The conclusion is often thought of as the easiest part of the paper but should by no means be disregarded. There are a number of key components which should not be omitted. These include:

- a) summary of question posed
- b) summary of findings
- c) summary of main limitations of the study at hand
- d) details of possibilities for related future research

Reference

From the very beginning of a research project, you should be careful to note all details of articles gathered.

The bibliography should contain ALL references included in the paper. References not included in the text in any form should NOT be included in the bibliography.

The key to a good bibliography is consistency. Choose a particular convention and stick to this.

Conventions

Monographs

Crystal, D. (2001), Language and the internet. Cambridge: Cambridge University Press.

Edited volumes

Gass, S./Neu, J. (eds.) (1996), Speech acts across cultures. Challenges to communication in a second language. Berlin/ NY: Mouton de Gruyter.

[(eds.) is used when there is more than one editor; and (ed.) where there is only one editor. In German the abbreviation used is (Hrsg.) for Herausgeber].

Edited articles

Schmidt, R./Shimura, A./Wang, Z./Jeong, H. (1996), Suggestions to buy: Television commercials from the U.S., Japan, China, and Korea. In: Gass, S./Neu, J. (eds.) (1996), Speech acts across cultures. Challenges to communication in a second language. Berlin/ NY: Mouton de Gruyter: 285-316.

Journal articles

McQuarrie, E.F./Mick, D.G. (1992), On resonance: A critical pluralistic inquiry into advertising rhetoric. Journal of consumer research 19, 180-197.

Electronic book

Chandler, D. (1994), Semiotics for beginners [HTML document]. Retrieved [5.10.'01] from the World Wide Web, <http://www.aber.ac.uk/media/Documents/S4B/>.

Electronic journal articles

Watts, S. (2000) Teaching talk: Should students learn 'real German'? [HTML document]. German as a Foreign Language Journal [online] 1. Retrieved [12.09.'00] from the World Wide Web, <http://www.gfl-journal.com/>.

Other weFTtes

Verterhus, S.A. (n.y.), Anglicisms in German car advertising. The problem of gender assignment [HTML document]. Retrieved [13.10.'01] from the World Wide Web, <http://olaf.hiof.no/~sverrev/eng.html>.

Unpublished papers

Takahashi, S./DuFon, M.A. (1989), Cross-linguistic influence in indirectness: The case of English directives performed by native Japanese speakers. Unpublished paper, Department of English as a Second Language, University of Hawai'i at Manoa, Honolulu.

Unpublished theses/ dissertations

Möhl, S. (1996), Alltagssituationen im interkulturellen Vergleich: Realisierung von Kritik und Ablehnung im Deutschen und Englischen. Unpublished MA thesis, University of Hamburg.

Walsh, R. (1995), Language development and the year abroad: A study of oral grammatical accuracy amongst adult learners of German as a foreign language. Unpublished PhD dissertation, University College Dublin.

Appendix

The appendix should be used for data collected (e.g. questionnaires, transcripts, ...) and for tables and graphs not included in the main text due to their suIFTdiary nature or to space constraints in the main text.

Assessment Scheme:

Continuous Evaluation:30%

(Based on abstract writing, interim draft, general approach, research orientation, readings undertaken, progress report etc.)

Final Evaluation:70%

(Based on the organization of the paper, objectives/ problem profile/ issue outlining, comprehensiveness of the research, flow of the idea/ ideas, relevance of material used/ presented, outcomes vs. objectives, presentation/ viva etc.)

Examination Scheme:

| Components | PR1 | PR2 | FP | V | FP |
|-------------------|------------|------------|-----------|----------|-----------|
| Weightage | 10 | 20 | 30 | 20 | 20 |

PR1-Progress Report 1, PR2-Progress Report 2, FP – Final Paper, E-Execution, FP – Final Presentation, V – Viva

Syllabus - Ninth Semester

WEB DEVELOPMENT WITH ASP DOT NET

Course Code: IFT6909

Credit Units: 03

Course Objective

The goal of this course is to introduce web application development using the .NET framework by covering the Common Language Runtime (CLR), .NET framework classes, C#, ASP.NET, and ADO.NET.

The student is expected to be able to on completion of the course:

- Develop and configure web applications with ASP.NET with clearly separated presentation-, logic and database layers.
- Integrate web applications with different data sources, web services and external systems.
- Use the security model in ASP.NET for authentication and authorization
- Evaluate different solutions suitability based on the client's need and a performance

Course Contents:

Module-I

Introduction to Microsoft ASP.NET, .Net Framework, An overview of .NET including the Common Language Interface, the Common Type System, the Common Language Runtime, and .NET Framework and class libraries. The ASP.NET execution model.

Module-II

ASP.NET Web Application User Interface: Creating an ASP.NET Web application user interface, Implementing event handlers by using code-behind files, Client-side and Server-side controls, events.

Creating a User Interface: Using Controls, Validating Data, Navigating Between Forms.

Implementing Master Pages and User Controls: Creating Master Pages, Adding User Controls to an ASP.NET Web Form.

Ajax: Introduction to AJAX, AJAX Toolkit, Partial page update using AJAX, Extending an ASP.NET Web Forms Application by Using the Ajax Control Toolkit.

Module-III

Managing State: The Various Means to ManageState, Request object, Application object, Cache object, Session object, Server-side state management, using session for server-side and client-side state management.

XML Web Services: Need of XML Web services, Understanding the Web Service Model, Creating an ASP.NET Web Service, Creating & Consuming Web Services with Visual Studio .NET.

Module-IV

Storing and Retrieving Data with ADO.NET: ADO.NET Overview, Connecting to Data, Executing SQL with Commands, Accessing Data with ADO.NET, Fast Data Access with DataReaders, DataSet Basics, Filling DataSets with DataAdapters, Using Data Sets on Web Forms, Processing Transactions

Data Binding: Bind Data to the UI, Transform and Filter Data.

Security: Authenticating and Authorizing Users, Using Windows Authentication, Using Forms Authentication.

Module-V

Configuring, Deploying and Debugging Web Application: Configuration Files, Configuration Settings, Debugging Applications, Deploying an ASP.NET Web Application

Examination Scheme:

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

Text & References**Text:**

- Matthew MacDonald: ASP.NET: The Complete Reference, Osborne.

References:

- Jesse Liberty, Dan Hurwitz: Programming ASP.NET, O'Reilly.
- Stephen Walther: ASP.NET 3.5 Unleashed, SAMS.
- Liberty," Programming ASP.NET 3.5 4th Edition", Shroff/O'Reilly.

NETWORK SECURITY & CRYPTOGRAPHY

Course Code: IFT6910

Credit Units: 04

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 involvement, communication and networking. Thus the course is introduced to make the student acquainted with the concepts and practices to make the network environment secure.

Course Contents:

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, Galois Field

Module-II

Introduction to security attacks, services and mechanism, Classical encryption techniques, substitution cipher: caesar cipher, playfair cipher, mono/polyalphabetic cipher, hill cipher, affine cipher. Transposition techniques: columnar cipher, rail fence cipher up to two round. Stream and block ciphers. Modern Block Ciphers: Block ciphers principles, Shannon's theory of confusion and diffusion, feistel structure, Data encryption standard (DES), Strength of DES.

Module-III

Principals of public key crypto systems, RSA algorithm, security of RSA, Elgamal Cryptosystem, Rabin Cryptosystem. Message Digest: Authentication requirements, authentication functions, hash function and SHA-1, message authentication code. Concept of Digital Signature, RSA and Elgamal, ECC,

Module-IV

Key Management and distribution: Symmetric key distribution, Diffie-Hellman Key Exchange, Public key distribution, X.509 Certificates, Public key Infrastructure. Entity authentication, Authentication Applications: Kerberos, Needham Schroeder protocol

Module-V

IP Security: Architecture, Authentication header, Encapsulating security payloads, SSL, HTTPS, SET, 3-D Secure, Viruses, Worms, Malware, Botnets, Firewall and its types.

Examination Scheme:

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

Text & References:

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

SOFT COMPUTING

Course Code: IFT6911

Credit Units: 04

Course Objective:

To develop the concepts and techniques and foster their abilities in designing and implementing soft computing based solutions for real-world and engineering problems.

Course Contents:

Module I: Introduction of Soft Computing

Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing. Artificial Intelligence : Introduction, Various types of production systems and Searches.

Module II: Neural Network

Structure and Function of a single neuron: Biological neuron, artificial neuron, definition of ANN, , Difference between ANN and human brain, characteristics and applications of ANN, Supervised Learning Network, Unsupervised Learning Networks, Associative Memory Networks, Adaptive Resonance Theory: Architecture, classifications, Implementation and training.

Module III: Fuzzy Logic

Introduction to Fuzzy Logic, Classical Sets and Fuzzy Sets, Classical Relations and Fuzzy Relations, Membership Functions, Defuzzification, Fuzzy Arithmetic and Fuzzy Measures, Fuzzy Rule Base and Approximate Reasoning, Fuzzy Decision Making, Fuzzy Logic Control Systems.

Module IV: Genetic algorithm

Fundamentals, basic concepts, working principle, encoding, fitness function, reproduction, Genetic modeling: Inheritance operator, cross over, inversion & deletion, mutation operator, Bitwise operator, Generational Cycle, Convergence of GA, Applications & advances in GA, Differences & similarities between GA & other traditional methods.

Examination Scheme:

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

Text Book.

- S.N. Sivanandam & S.N. Deepa, Principles of Soft Computing, Wiley Publications

References Book:

- S, Rajasekaran & G.A. Vijayalakshmi Pai, Neural Networks, Fuzzy Logic & Genetic Algorithms, Synthesis & Applications, PHI Publication.
- Bose, Neural Network fundamental with Graph, Algo. & Appl, TMH
- Kosko: Neural Network & Fuzzy System, PHI Publication
- Klir & Yuan, Fuzzy sets & Fuzzy Logic: Theory & Appli., PHI Pub.
- Hagen, Neural Network Design, Cengage Learning

CLOUD COMPUTING

Course Code: IFT6912

Credit Units: 03

Course Objective:

This course gives students an insight into the basics of cloud computing along with introduction to virtualization. Cloud computing is one of the fastest growing domain from a while now. It will provide the students basic understanding about cloud and virtualization domain along with it gives an introduction to VMWare simulator for virtualizing cloud based environments.

Course Contents:

Module-I: Cloud Computing Overview: Origins of Cloud computing – Cloud components - Essential characteristics – On-demand self-service, Broad network access, Location independent resource pooling, Rapid elasticity, measured service, Roots of cloud computing, Architectural influences – High-performance computing, Utility and Enterprise grid computing, Cloud scenarios – Benefits: scalability, simplicity, vendors, security, Limitations

Module-II: Cloud Architecture- Layers and Models: The cloud reference model: Architecture, Software as a Service (SaaS), features of SaaS and benefits, Platform as a Service (PaaS), features of PaaS and benefits, Infrastructure as a Service (IaaS), features and benefits of IaaS, Service providers, challenges and risks in cloud adoption, Cloud deployment model: Public clouds – Private clouds – Community clouds - Hybrid clouds - Advantages of Cloud computing

Module-III: Virtualization: Virtualization and cloud computing - Need of virtualization – cost, administration, fast deployment, reduce infrastructure cost – limitations, Characteristics of virtualized environments Types of hardware virtualization: Full virtualization - partial virtualization - para virtualization. Desktop virtualization: Software virtualization – Memory virtualization – Storage virtualization – Data virtualization – Network virtualization

Module-IV: Cloud Simulators- CloudSim and GreenCloud: Introduction to Simulator, understanding CloudSim simulator, CloudSim Architecture (User code, CloudSim, GridSim, SimJava) Understanding Working platform for CloudSim, Introduction to GreenCloud

Module-V: Introduction to VMWare Simulator: Basics of VMWare, advantages of VMware virtualization, using VMware workstation, creating virtual machines-understanding virtual machines, create a new virtual machine on local host, cloning virtual machines, virtualize a physical machine, starting and stopping a virtual machine

Examination Scheme:

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

Text & References:

Text:

- Cloud computing a practical approach - Anthony T.Velte , Toby J. Velte Robert Elsenpeter, TATA McGraw- Hill , New Delhi – 2010
- Mastering Cloud Computing- Foundations and Applications Programming - RajkumarBuyya , Christian Vecchiola and S. ThamaraiSelvi, Tata McGraw Hill, New Delhi, India, 2013
- Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online - Michael Miller - Que 2008

References:

- Cloud computing for dummies- Judith Hurwitz , Robin Bloor , Marcia Kaufman , Fern Halper, Wiley Publishing, Inc, 2010
- Cloud Computing (Principles and Paradigms), Edited by RajkumarBuyya, James Broberg, Andrzej Goscinski, John Wiley & Sons, Inc. 201

DATA WAREHOUSING AND DATA MINING

Course Code: IFT6913

Credit Units: 04

Course Objective:

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

Course Contents:

Module I: Data Warehousing

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.

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 II: 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 III: Data Mining

Introduction to Data Mining, Applications, Limitations, Techniques, Association Rules: Priori Algorithm, Direct Hashing and Pruning (DHP), Classification: Decision Tree, Split Algorithm based on Information Theory, Bayes Method.

Module IV: Cluster Analysis: Concepts and Methods

Cluster Analysis: Features, Types of Cluster Analysis Methods: Partitional, Hierarchical, Density Based, Grid based Methods, , Web Data Mining, Search Engine, Case Study, Limitations.

Module V: Web Mining

Introduction, Classifying Web pages, extracting knowledge from the web. Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Databases, Multimedia Databases, Time Series and Sequence Data, Text Databases, World Wide Web, Applications and Trends in Data Mining

Examination Scheme:

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

Text & References:

Text:

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

References:

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

WEB DEVELOPMENT WITH ASP.NET LAB

Course Code: IFT6914

Credit Units: 02

Course Contents:

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

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, A- Attendance

SOFT COMPUTING LAB

Course Code: IFT6915

Credit Units: 01

Course Objective:

To developing and designing the ability to implement the basic neural networks, fuzzy systems, and optimization algorithms concepts and their relations.

Program:-

1. Write a program in MATLAB to perform Union, Intersection and Complement operations.
2. Write a program in MATLAB to implement De-Morgan's Law.
3. Write a program in MATLAB to plot various membership functions.
4. Generate ANDNOT function using McCulloch-Pitts neural net by MATLAB program.
5. Generate XOR function using McCulloch-Pitts neural net by MATLAB program.
6. Write a MATLAB program for Hebb Net to classify two dimensional input patterns in bipolar with targets.
7. Write a MATLAB program for Perceptron net for an AND function with bipolar inputs and targets.
8. Write a M-file to calculate the weights for the following patterns using hetero-associative neural net for mapping
9. four input vectors to two output vectors
10. Write an M-file to store the vector, find the weight matrix with no self-connection. Test this using a discrete Hopfield net.

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, A- Attendance

DATAWARE HOUSING & DATA MININGLAB

Course Code: IFT6916

Credit Units: 01

Course Contents:

Assignments and exercises will be provided for the following:

- Histogram, Scatter Plots & Regression.
- Classification algorithms.
- Clustering algorithms.
- Association Rules

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, A- Attendance

DISTRIBUTED OPERATING SYSTEM

Course Code: IFT6917

Credit Units: 04

Course Objective:

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

Course Contents:

Module I: Introduction

Distributed Operating System: Introduction, Issues, Inherent Limitations. Lamport's Logical Clocks, Vector Clock, Global State, Orphan Messages, Domino Effect, ChandyLamort's Algorithm, Koo-Toueg Algorithm,

Module II: Distributed Mutual Exclusion

Introduction: Lamport's Algorithm, The Ricart –Agarwala Algorithm, Suzuki- Kasamis Broadcast Algorithm, Raymond's Tree- Based Algorithm, A Comparative Performance Analysis

Module III: Synchronization in Distributed System

Deadlocks in Distributed Systems, Centralized Deadlock- Detection Algorithms, Distributed Deadlock Detection Algorithm' Path Pushing Algorithm, Edge Chasing Algorithm, Diffusion Computation Based Algorithm.

Distributed Scheduling: Issues in Load Distributing. Components of a Load Distributed Algorithm, Stability, and Load Distributed Algorithms: Sender Initiated Algorithms, Receiver Initiated Algorithms, Symmetrically Intimated Algorithms, Adaptive Algorithms.

Module IV: Distributed Shared Memory

Introduction, Architecture & Motivation Algorithms for Implementing DSM: The Central – Server Algorithms, The Migration Algorithms, The Read – Replication Algorithms, The Full- Replication Algorithms. Memory Coherence, Coherence Protocols: Write Invalidate Protocol, Write Update Protocol, Design Issues: Granularity, Page Replacement

Module V: Concurrency Control Algorithms

Basic Synchronization Primitives, Two –Phase Locking Protocol, Timestamp Based Algorithms, Two – Phase Commit Protocol. Voting Protocols: Static Voting, Majority Based Dynamic Voting Protocol.

Examination Scheme:

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

Text & References:

- SinghalShivratri Advanced Concepts in Operating Systems TMH 1994.
- M. Beck et al Linux Kernel, Internal Addition Wesley, 1997.
- B. W. Kernighan and R Pide, The Unix Programming Environment Prentice Hall of India - 2000.
- A. Silberschatz P.B Galvin Operating System Concept, John Wiley & Sons (Asia) 2000.
- Cox K, "Red Hat Linux Administrator's Guide". PHI (200).

ADVANCE DATABASE SYSTEM

Course Code: IFT6918

Credit Units: 03

Course Objective:

The purpose of this course is to provide students with a strong foundation in advanced database concepts from an industry perspective. The course covers advanced data modeling concepts like query processing, transaction and concurrency control techniques. Students also learn object-oriented and object-relational database, distributed database concepts as well as the growing relationship between databases and the World Wide Web.

Course Contents:

Module I: Query Processing

Basic concepts of query processing, converting SQL queries into Relational Algebra, Basic Algorithms for executing query operations, Query tree and query graph, Heuristic optimization of query tree.

Module II: Parallel and Distributed Database

Database system architectures: Centralized & client-server architectures, server-system architectures, parallel systems, distributed systems, distributed database design and implementation, Transparencies in Distributed Databases, Transaction control in Distributed Database, Query Processing in Distributed Database.

Module III: Object Oriented and Extended Relational Database Technologies

Overview of Object oriented database, OO Concepts, Encapsulation of Operations and methods, Inheritance, Object Model, Object definition language, Object Query Language, Object Relational and Extended- Relational systems: Object Relational features in SQL/Oracle.

Module IV: Emerging Database Trends

Object oriented databases, Data warehousing and Data Mining, Active database, Spatial Database, Spatial Queries, Deductive database, Temporal database, Multimedia database, Introduction to Big Data.

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:

- Data Base Management System, Leon & Leon, Vikas Publications
- Introduction to Database Systems, Bipin C Desai, Galgotia

ADVANCE DATABASE SYSTEM LAB

Course Code: IFT6919

Credit Units: 01

Course Contents:

- Develop Simple and Extended Entity Relationship Diagram to explain data requirement for a given Business Model
- Develop Data Flow Diagram to explain the flow and transformation of data in a given Business Model
- Work with Oracle using SQL while designing database table and performing various queries on the database.
- Use of various oracle functions to retrieve data in various form from database table
- Make SQL queries based on multiple tables of a database

1) A Private Nursing Home has hired you as a database expert to maintain information about Patients, Doctors, Treatments and other related details i.e. Medicine prescribed, lab tests recommended and Doctor's Remark given to the patient by the doctor. Justify your role as a responsible database designer by developing suitable ER Diagram and Data Flow Diagram. Also mention all possible assumptions which is helpful in producing correct database design. Draw a suitable layout for designing the Database.

2) A Librarian has hired a database designer to maintain information about its members of library, books, library rules and other related details i.e. about issue of books, returns of books etc. You have to draw a suitable ER Diagram and Data Flow Diagram and also suggest a suitable database design to maintain above mentioned data keeping in mind redundancy and consistency of data.

3) A Book Publishing House has to maintain data regarding Books Published, Author's of the Books, Detail of Customers asking for books and detail of order placed by customer. Draw a suitable E R Diagram and Data Flow Diagram and also suggest a suitable database design to maintain all the above mentioned data. Make all suitable assumption for running the business process.

4) Examination department of the university wants to computerized the examination process and by maintaining data about students, course, date sheet of exams, Final Grade obtained by students semester wise. Draw a suitable E R Diagram and Data Flow Diagram to explain the examination process. Also draw a suitable layout for designing the database which is capable of maintaining above mentioned data.

- 5) Implement the following based on above mention business process:
- a) Apply all possible integrity constraints into the database to maintain the integrity and consistency of data.
 - b) Perform various types of SQL queries to retrieve data from multiple tables (Two or Three)
 - c) Suggest and create some suitable views based on the database from one or more Tables.
 - d) Use various oracle function including group functions through multiple table.
 - e) Perform some select command on view created from one or more Tables

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, A- Attendance

BIG DATA

Course Code: IFT6920

Credit Units: 03

Course Objective:

This course brings together several key technologies used in manipulating, storing, and analyzing big data. The course contents are focused on the key concepts of Big Data and Hadoop as a technology to deal with big data

Course Contents:

Module I: Introduction to Big Data

Big Data : Definition, Sources, Importance & Applications, 5 V's of Big Data, Complexity of Big Data, Big data processing architecture, Big Data Analytics, Big data problems & challenges.

Module II: Working with Hadoop

Hadoop concepts : History, comparison with other systems : RDBMS, Grid computing, Cluster Computing, Cloud Computing, Hadoop Architecture, Hadoop Distributed file system : Data node, Name node, job tracker, task tracker, Moving data in and out of Hadoop, Common Hadoop shell commands.

Module III: Working with Map Reduce

Map Reduce framework, Working of MapReduce: Job Scheduling, Shuffle and Sort, Task Execution, MapReduce Types, Formats and Features

Module IV: Working with Hive, HBase, PIG

Working with Pig: Pig Latin, User Defined Functions and Operators

Hive: Architecture, Comparison with traditional database, Hive QL- querying data, sorting & aggregation, joins & subqueries

HBase : Fundamentals of HBase, HBase Versus RDBMS, Schema design

Examination Scheme:

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

Text & References:

Text:

- Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis and Paul Zikopoulos, 2012, Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data, McGrawHill Publishing.
- Tom White, 2012, Hadoop: The Definitive Guide, Third Edition, O'reilly Media.

BIG DATA LAB

Course Code: IFT6921

Credit Units: 01

Course Contents:

- Installation & Configuration steps of Hadoop
- Working with HDFS commands :mkdir, rmdir, rm, mv, ls, du, put, rm-r, cat, tail etc
- Working with vi editor
- Working with Java Map Reduce : Map Class, Reduce Class, Driver Class, map side joins, reduce side joins
- Working with Hive : Queries for Hive : Create table, describe database, describe table, describe extended table, describe formatted table, drop table, drop database, display table, where clause
- Commands : Load Files on table : Load from HDFS, load from local
- Command :CTAS Create table as select
- Queries to create external tables
- Working with commands like : Order by, group by, like, upper, lower, max, min
- Working with PIG : Order by, group by, co group, like, upper, lower,Joins, Union, Cartesian, Product,
- Working with HBase : Start the hbase, data insert, modify, multiple version insertion, describe, delete truncate, drop etc

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, A- Attendance

SUMMER INTERNSHIP EVALUATION-IV

Course Code: IFT6935

Credit Units: 05

Guidelines:

There are certain phases of every Intern's professional development that cannot be effectively taught in the academic environment. These facets can only be learned through direct, on-the-job experience working with successful professionals and experts in the field. The internship program can best be described as an attempt to institutionalize efforts to bridge the gap between the professional world and the academic institutions. Entire effort in internship is in terms of extending the program of education and evaluation beyond the classroom of a university or institution. The educational process in the internship course seeks out and focuses attention on many latent attributes, which do not surface in the normal classroom situations. These attributes are intellectual ability, professional judgment and decision-making ability, inter-disciplinary approach, skills for data handling, ability in written and oral presentation, sense of responsibility etc.

In order to achieve these objectives:

- **Each student will be allotted a supervisor** for proper guidance.
- **Student will first submit synopsis in the format given by coordinator/supervisor.**
- Student will maintain a file (**Internship File/Project Report**). **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
- **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
Table of Content
Acknowledgement
Student Certificate
Company Profile (optional)
Introduction
Main Body
References / Bibliography

The File will include *five sections* in the order described below. The content and comprehensiveness of the main body and appendices of the report should include the following:

1. **The Title Page**--Title - An Internship Experience Report For (Your Name), name of internship organization, name of the Supervisor/Guide and his/her designation, date started and completed, and number of credits for which the report is submitted.

2. **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). 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. **Acknowledgements**--This is page number (iii). Keep this brief and avoid using informal language. This page must be signed by the candidate.

5. **Abstract and Keywords**--This is page number (iv). 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.

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

8. **Introduction**--short, but should include how and why you obtained the internship experience position and the relationship it has to your professional and career goals.

9. **Main Body**--should include but not be limited to daily tasks performed. Major projects contributed to, dates, hours on task, observations and feelings, meetings attended and their purposes, listing of tools and materials and their suppliers, and photographs if possible of projects, buildings and co-workers.

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

60 Marks

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

Examination Scheme:

| Components | V | S | R | PR | FP |
|----------------------|----------|----------|----------|-----------|-----------|
| Weightage (%) | 20 | 20 | 20 | 20 | 20 |

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

Syllabus - Tenth Semester

MAJOR PROJECT / DISSERTATION

Course Code: IFT6037

Credit Units: 30

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 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.

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
50 Marks

Final Assessment
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