

MANONMANIAM SUNDARANER UNIVERSITY
B.C.A

(CHOICE BASED CREDIT SYSTEM)

(WITH EFFECT FROM THE ACADEMIC YEAR 2020 -2021)

Se m	Partl /II/II I/IV/ v/vI	Sub · No.	Subject Status	Subject Title	Conta ct Hrs/ week	L Hrs/ Wee k	T Hrs/ Wee k	P Hrs/ Wee k	Cr edi ts
III	III	15	Core	Java Programming	5	5	0	0	4
	III	16	Core	Financial accounting	4	4	0	0	4
		17	Core	Introduction to Internet with HTML	4	4	0	0	4
	III	18	Major Practical III	Java Programming Lab	4	0	0	4	2
	III	19	Allied - III	Data Structure	3	3	0	0	3
	III	20	Allied Practical III	Data Structure LAB	4	0	0	4	2
	III	21	Skill based Core Theory I	Programming with PHP and MySQL	4	4	0	0	4
	IV	22	Non major elective	Introduction to IT/Introduction to Computers	2	2	0	0	2
	IV	23	Common	Yoga(Excluding contact Hours& Credit)	2	2	0	0	2
	Sub Total					30			
IV	III	24	Core	Visual Basic	5	5	0	0	4
	III	25	Core	E-Commerce	4	4	0	0	4
		26	Core	Resource Management Techniques	4	4	0	0	4
	III	27	Major Practical IV	Visual Basic Lab	4	0	0	4	2
		28	Allied - IV	Accounting software- Tally	3	3	0	0	3
	III	29	Allied Practical IV	Tally Lab	4	0	0	4	2
	III	30	Skill Based core Theory II	Micro Processor	4	4	0	0	4
	IV	31	Non major elective	Introduction to Internet with HTML/ MS WORD	2	2	0	0	2
	IV	32	Common	Computer for digital era(Excluding contact hrs& Credit)	2	2	0	0	2
	V	33	Extension activity	NCC,NSS,YRC,YWF	-	0	0	-	1
Sub Total					30				26

v	III	34	Core	Software engineering	4	4	0	0	4
	III	35	Core	Web Technology	5	5	0	0	4
	III	36	Core	RDBMS	6	6	0	0	4
	III	37	Major Practical V	RDBMS Lab	4	0	0	4	2
	III	38	Major Elective I	Artificial Intelligence/Design and Analysis of Algorithm/cyber security/multimedia	4	4	0	0	4
	III	37	Project	Mini Project	5	0	0	5	4
	IV	38	Common	Personality development	2	2	0	0	2
	Sub Total					30			
VI	III	39	Core	Operating systems	4	4	0	0	4
	III	40	Core	Computer networks	5	5	0	0	4
	III	41	Core	Computer graphics	6	6	0	0	4
	III	43	Major Practical VI	Graphics Lab	4	0	0	4	2
	III	44	Major elective II	Web services/software project management/ mobile communication/system programming	4	4	0	0	4
	III	45	Project	Major Project -(group)	7	0	0	0	7
	Sub Total					30			

Total Credit = 21+21+25+26+24+25 >= 140 (Excluding Computer era & Yoga)

L-Lecture

T-Tutorial

P- Practical

Distribution of marks between External and Internal Assessment is

For Theory 75 : 25 For Practical 50 : 50

JAVA PROGRAMMING

L T P C

5 0 0 4

COURSE OBJECTIVES:

- To learn Object Oriented Programming language.
- To handle abnormal termination of a program using exception handling.
- To design user Interface using AWT.

UNIT – 1 History, Data Types and Operators

History & Evolution of Java: Creation of Java – The java Buzz words – An overview of Java Object Oriented Programming. Data types: Primitive types – Floating point types – Characters – Booleans – A closer Look at Literals – Variables – Type conversion and casting – Automatic type promotion in Expressions. Arrays: One Dimensional Array – Multi Dimensional Arrays. Operators: Arithmetic Operators – Bitwise operators – Relational operators – Boolean Logical operators – Assignment operators – Conditional operators–Operator Precedence. **(12 L)**

UNIT - 2 Classes, Methods and Inheritance

Class Fundamentals – Declaring objects – Assigning object Reference variables – Introducing Methods – Constructors – This Keyword - Garbage collection– Stack class. A Closer Look at Methods and Classes: Overloading Methods – Using object as parameters – Argument passing – Returning objects – Recursion – Introducing Access control – understanding static – Introducing final – Nested and Inner classes – String class – Using command line arguments. Inheritance: Basics – Using super – creating Multilevel Hierarchy – Method overriding – Dynamic Method Dispatch – Using Abstract class – Using final with inheritance – The object class. **(12 L)**

UNIT - 3 Packages, Interfaces, Exception Handling and Multithreading

Packages – Package and Member Access-Importing packages – Interfaces. Exception Handling: Fundamentals – Exception Types – Uncaught Exceptions – Using try and catch – Multiple catch clauses – Nested try statements – throw- throws- finally – Java’s Built – in Exception – creating your own Exception subclasses – Chained Exceptions. Multithreaded Programming: Java Thread Model – Main Thread – Creating a Thread - Creating Multiple Threads–Using is Alive () and join () – Thread priorities – Synchronization – Interthread Communication – Suspending Resuming: and stopping Threads – Using Multithreading. **(12 L)**

UNIT – 4 Networking and Event Handling

Basics – Networking Classes and Interfaces – Inet Address – Inet4 Address and Inet6 Address – TCP/IP client Sockets – URL – URL Connection – HTTP URL Connection – Cookies. Event Handling: Two Event handling Mechanisms – Delegation Event Model – Event classes – Sources of Events – Event Listener Interfaces. **(12 L)**

UNIT - 5 AWT and AWT Controls

AWT Classes – Window fundamentals – working with Frame Windows - working with Graphic Using AWT controls: Controls fundamentals – Labels – using Buttons – Applying check Boxes – Check Box group – Choice controls – Using a Text field – Using a Text Area – Understanding Layout Managers (Flow Layout only) – Menu Bars and Menus. **(12 L)**

COURSE OUTCOMES:

- To get knowledge of the structure and model of the Java programming language.
- Able to use the Java programming language for various programming technologies.
- To get Knowledge for developing software in the Java programming language.

TEXT BOOK:

JAVA - The Complete Reference, Eleventh Edition, E Herbert Schildt, Oracle Press, 2019

REFERENCE BOOKS:

1. Core and Advanced Java Programming – Black Book, Dreamtech Press, 2018
2. Programming with Java - A Primer, E. Balaguruswamy, Sixth Edition, 2016

CORE SUBJECT – II
FINANCIAL ACCOUNTING

L T P C

4 0 0 4

COURSE OBJECTIVES:

- To impart basic accounting knowledge.
- To provide knowledge on the fundamental of financial accounting.
- To expose the student to various financial transaction and its current applications.

UNIT -1 BASIC CONCEPTS OF ACCOUNTING

Introduction to Accounting : Need for Accounting –Accounting as the language of business – Attributes and steps of Accounting –Book keeping Vs Accounting – Branches of Accounting – Methods of Accounting – Types of Accounting – Accounting Rules - Bases of Accounting – Accounting terminology. Basic Accounting Concepts: Meaning and classification of Accounting- Accounting Concepts – Accounting Conversion – Accounting equations. **(10 L)**

UNIT – 2 JOURNAL AND LEDGER

Recording a Financial Data: Memorandum Book, business transaction, Journal, Rules for Debit and Credit, Compound Journal entry, Advantages of Journal, Ledger, Ledger Account, Ledger Posting, Process of Posting, Balancing of An Account, Significance of Balances, Relation between Journal and Ledger-Subsidiary Books. **(15 L)**

UNIT – 3 PREPARING TRIAL BALANCE

Trial Balance: Objects, Methods of Preparing Trial balance, how to locate errors, hints for the preparation of trial balance & problems. **(11 L)**

UNIT -4 FINAL ACCOUNTS

Trading account – individual items posted to the debit of trading account – individual items credited to trading account – advantages of trading account – profit & loss account - advantages of profit & loss account- manufacturing account- balance sheet- classification of assets & liabilities. **(12 L)**

UNIT – 5 ACCOUNTS FOR NON PROFIT ORGANISATION

Introduction – Final accounts of no trading concern- receipts and payments account – features- income & expenditure account – feature- distinction between the two – treatment of special items – some important adjustments – types of problems – Distinction between income and expenditure account and profit and loss account – accounts of professional men. **(12 L)**

COURSE OUTCOMES:

- To acquire knowledge about general aspects of business operations.
- To explain the concepts and procedures of financial reporting, including income and expenditure statement, balance sheet etc.
- To locate and analyze financial data from annual reports of corporations.

TEXT BOOKS:

1. Financial Accounting by T.S.Reddy, A.Murthy – Margham Publications, 2012.
2. Fundamentals of Advanced Accounting by R.S.N.Pillai, Bagavathi, S,Uma, 5th Edition, Schand Publication, 2012.

REFERENCE BOOKS:

1. Essentials of Financial Accounting – by Asish K.Bhattacharayya, PHI, 2020
2. Advanced Accountancy by S.P.Jain and Narang – Kalyani Publications, 2017.

CORE SUBJECT - III

INTRODUCTION TO INTERNET WITH HTML

L T P C

4 0 0 4

COURSE OBJECTIVES

- To learn the principle of Web page design.
- To visualize the basic concept of HTML.
- To recognize the elements of HTML.

UNIT I INTRODUCTION TO INTERNET

Computer in business-networking-Internet- e-mail-gopher-world wide web, Internet Technologies – Internet Browsers. **(12L)**

UNIT II INTRODUCTION TO HTML

History of HTML - HTML generation and Documents – Tags and Links Head and Body Section. **(12 L)**

UNIT III DESIGNING TABLES

Designing Body Section – Ordered and Unordered List – Table Handling **(12 L)**

UNIT IV INTRODUCTION TO DHTML

Features of DHTML – Defining styles – Working with Colors – Text and Fonts with Style. **(12 L)**

UNIT V FRAMES

Frame set Definition – Nested frames – A web design project – forms. **(12L)**

COURSE OUTCOMES:

- To create a web page.
- To validate a web page.
- To publish a web page.

TEXT BOOK:

World Wide Web Design with HTML, C.XAVIER, McGraw Hill Education, 2017

REFERENCE BOOK:

1. The Complete Reference HTML & CSS, Thomas A.Powell, McGraw Hill Education, 2017
2. Fundamental of the internet and the World Wide Web by Greenlaw and Hepp. TMH Publications. 2008

ALLIED SUBJECT – III DATA STRUCTURES

L T P C
3 0 0 3

COURSE OBJECTIVES:

- To understand different methods of organizing large amounts of data.
- To efficiently implement different data structure.
- To efficiently implement solution for different problems.

UNIT – 1 DATATYPES INTRODUCTION

Introduction: Pseudo code – The Abstract Data Type – A Model for an Abstract Data Type – Algorithms Efficiency. Searching: List Searches – Hashed List Searches – Collision Resolution. **(10 L)**

UNIT – 2 LINKED LISTS

Linear List Concepts – Linked List Concepts – linked List Algorithms – Processing a Linked List – Complex Linked List Structures. **(10 L)**

UNIT – 3 STACKS AND QUEUES

Basic Stacks Operations – Stack Linked List Implementation – Stack Applications – Queue operations – Queue Linked List Design. **(10L)**

UNIT – 4 TREES

Basic Tree Concepts – Binary Tree - Binary Tree Traversals – Expression Trees- General Trees – Binary Search Trees – Heap definition – Heap Structure – Basic Heap Algorithm. **(8L)**

UNIT - 5 INTRODUCTION TO GRAPHS

Sorting And Graphs: General Sort Concepts – Quick sort – External sorts. Graphs: Terminology – Operations–Graph storage Structure–Networks. **(7L)**

COURSE OUTCOMES:

- An understanding of the basic data structures.
- An understanding of the basic search and sort algorithms.
- The appropriate use of a particular data structure and algorithm to solve a problem.

TEXT BOOK:

1.Data Structures a Pseudo code Approach with C++, Richard F. Gilberg & Behrouz A forouzan, Thomsan Brooks/Cole. Chapters: 1,2.1,2.3,2.4,3.1-3.4,3.6,4.1-4.3,5.1,5.2,7.1-7.5,8.1,9.1- 9.5,11.1,11.4 (Quick Sort only) 11.6, 12.1-12.5.

REFERENCE BOOKS:

1. Fundamentals of Data Structures - Eilis Horowitz & Sartaj, Galgotia Publications 2008
2. Data Structures - Seymour Lipschutz, Tata McGrawHill, 2014

SKILL BASED CORE THEORY - I
PROGRAMMING WITH PHP & MYSQL

L T P C
4 0 0 4

COURSE OBJECTIVES:

- To understand the concepts of open sources.
- To learn and use open-source database management system MySQL
- To create dynamic web pages and websites.
- To connect webpages with database.

UNIT-1

Introduction: Introduction- Open source PHP – PHP history- features-variables-statements operators conditional statements-if-switch-nesting conditions-merging forms with conditional statements-loops-while-do-for – loop iteration with break and continue. **(12L)**

UNIT – 2

Arrays and Functions: Arrays: Creating an array- modifying array-processing array-grouping form with arrays- using array functions- creating user defined functions-using files- sessions cookies- executing external programs – Creating sample applications using PHP. **(12L)**

UNIT – 3

File Handling Opening files using fopen - looping over a files content with feof- reading text from a file using fgets - closing a file- reading character with fgetc- reading whole file with file_get_contents reading a file into an array with file-checking if a file exists-fscan fparse_ini_file- Getting file information with stat-fseek- copying files with copy-deleting files writing to a file-reading and writing binary files – locking files. **(12L)**

UNIT - 4 MySQL:

Effectiveness of MySQL -MySQL Tools-Prerequisites for MySQL connection Databases and tables- MySQL data types-Creating and manipulating tables-Insertion-updation and deletion of rows in tables -Retrieving data- Sorting and filtering retrieved data - Advanced data filtering Data manipulation functions-Aggregate functions -Grouping data-Subqueries Joining Tables- Set operators-Full text searching. **(12L)**

UNIT- 5 PHP with MySQL:

Working MySQL with PHP-database connectivity- usage of MYSQL commands in PHP processing result sets of queries- handling errors-debugging and diagnostic functions validating user input through Database layer and Application layer formatting query output with Character- Numeric- Date and time – sample database applications. **(12L)**

TEXT BOOKS

1. VIKRAM VASWANI- “PHP and MySQL”- Tata McGraw-Hill- 2005
2. BEN FORTA – “MySQL Crash course”, SAMS- 2006.
- 3 . Steven Holzner – “The Complete reference PHP”, Tata McGraw Hill,2008

REFERENCE BOOKS:

1. Tim Converse- Joyce Park and Clark Morgan- “PHP 5 and MySQL” -Wiley India reprint - 2008.
2. Robert Sheldon- Geoff Moes- “Beginning MySQL”-Wrox- 2005

MAJOR PRACTICAL – III
JAVA PROGRAMMING LAB

L T P C
0 0 4 2

PRACTICAL LIST

1. Write a java program to find the area of Square, Rectangle, and Triangle by
(a) Overloading Constructor Method (b) Overloading Method
2. Define a class called student with data members name, Roll Number and age.
3. Write a suitable constructor and method output () to display the details. Derive another class student 1 from the student with the data member's height and weight.
4. Write a suitable constructor and method output () to display the details which overwrites the super class method output(). (Apply Method Over riding concepts)
5. Write a java program to create a package "Employee" which contains the classes Emp and Emppay. The data members of Emp are name, empid, category, and Basicpay. Write suitable constructors and methods to compute the net pay of the employee. The class Emppay contains the main method.
6. Write a java program to create and Implement an Interface.
7. Write a java program to create a thread Using Thread Class.
8. Write a java program to Design a calculator to perform arithmetic operations.
9. Write a java program to demonstrate the use of choice box.
10. Write a java program, which creates a window with a checkbox group with boxes for the colors, violet, indigo, yellow, orange, red, blue and green. When the button is selected the background color must change accordingly.
11. Write a java program to throw the following Exception:
(a) Negative Array Size (b) Array Index out of Bounds
12. Write a java program to create a file menu with option New, Save and Close, Edit menu with option cut, copy, and paste.
13. Write a java programming to illustrate Mouse Event Handling.

ALLIED PRACTICAL LAB – III

DATA STRUCTURE LAB

L T P C

0 0 4 2

PRACTICAL LAB

1. Write a C++ program to implement sequential search and Binary search in array.
2. Write a C++ program to implement linked list and perform the following operations
(a) Add a node as first node. (b) Add a node as last node.
3. Write a C++ program to implement linked list and implement the following Objects.
(a) Delete the first node. (b) Delete the last node.
4. Write a C++ program to implement a stack linear list perform the push and pop Operations.
5. Write a C++ program to implement binary tree using Linked and perform the following traversal:
(a) In order traversal. (b) Pre order traversal. (c) Post order traversal.
6. Write a C++ program to implement merge sort.
7. Write a C++ program to implement quick sort.

**NON-MAJOR ELECTIVE PAPER
[CHOOSE ANY ONE]**

**INTRODUCTION TO INFORMATION TECHNOLOGY /
INTRODUCTION TO COMPUTERS**

**L T P C
2 0 0 2**

INTRODUCTION TO INFORMATION TECHNOLOGY

COURSE OBJECTIVES:

- To understand the principles of digital devices, computer hardware, software, telecommunications, networking and multimedia.
- This course provides a sound foundation on the basic theoretical and practical principles behind the technologies.
- To discuss up to date issues surrounding them including social aspects and how they impact everyday life.

UNIT - 1 INFORMATION TECHNOLOGY BASICS

Introduction, Information, Technology, Information Technology, Present Scenario, Role of Information Technology, Information Technology and internet, Careers in IT Industry. Computer Organization and Architecture: Central Processing Unit, inside a computer, Data representation in Computer, Coding Schemes. **(6 L)**

UNIT - 2 COMPUTER STORAGE AND MEMORY

Introduction, Memory Hierarchy, Random Access Memory (RAM), Read Only Memory (ROM), RAM, ROM and CPU interaction, Types of Secondary storage devices, Magnetic tape, Magnetic disk, types of magnetic disk, optical disk, type of optional disks. **(6 L)**

UNIT - 3 INPUT & OUTPUT DEVICES

Input, Output Media: Introduction, types of input devices, types of output devices, Multimedia. Essentials: Introduction, Multimedia definition, Building blocks of Multimedia, Multimedia system, Multimedia applications, Virtual reality. **(6 L)**

UNIT - 4 ABOUT INTERNET

The Internet: Introduction, Evolution of Internet – Basic Internet terms – Getting Connected to Internet – Internet Applications – Data over Internet. Internet tools: Introduction – Web Browser – Browsing Internet using Internet Explorer – E-Mail – Search engines – Instant messaging. **(6 L)**

UNIT V CURRENT TRENDS IN IT

Emerging trends in IT: Introduction, E-Commerce – Electronic Data Interchange – Mobile Communication – Bluetooth – Global Positioning System – Infrared Communication – Smart Card – Imminent Technologies. **(6 L)**

COURSE OUTCOMES:

- To understand the architecture of the computer.
- To know about internet & its applications.

TEXT BOOK:

Introduction to Computer and Information Technology - D.GloryRatha Mary, S.Selvanayahi, Shekina Publications.

REFERENCE BOOKS:

1. A book of Fundamentals of Information Technology - Anshuman Sharma, Vishal Sharma, Hardeep Singh & S.K.Kakkar, 5th Edition, Panjab University, 2020
2. Fundamentals of Information Technology - Anoop Mathew, S.Kavitha Murugesan, Narosa , 2013
3. Introduction to Information Technology - V.Rajaraman, PHI, 2018.

INTRODUCTION TO COMPUTERS

L T P C
2 0 0 2

COURSE OBJECTIVES:

- To learn about basic components of the computer.
- To study functions and types of operating system.
- To study about software Installation.

UNIT – 1 COMPUTER BASICS

Introduction, Characteristics of Computers – Evolution of Computers, Generation of Computers, Classification of Computers, the Computer System, Application of Computers. **(6 L)**

UNIT – 2 COMPUTER ORGANIZATION AND ARCHITECTURE

Central Processing Unit, Inside a computer, Data representation in Computer, Coding Schemes. **(6 L)**

UNIT - 3 INPUT & OUTPUT UNITS

Computer input units, Computer output units. **(6 L)**

UNIT – 4 MEMORY & STORAGE DEVICES

Computer Memory and Storage: Introduction, Memory Hierarchy, Random Access Memory (RAM), Read Only Memory (ROM), RAM, ROM and CPU interaction, Types of Secondary storage devices, Magnetic tape, Magnetic disk, types of magnetic disk, optical disk, type of optional disks. **(6 L)**

UNIT – 5 OPERATING SYSTEM

Introduction, Operating System, Definition, Evolution of Operating System, Types of Operating System, Functions of Operating System. Computer Software: Introduction, Computer Software, Definition, Categories of Software, Installing and Uninstalling software, Software piracy, Software terminologies. **(6 L)**

COURSE OUTCOMES:

- To understand the meaning and basic components of a computer system, define and distinguish Hardware and Software components of computer system.

TEXT BOOK:

Introduction to Computer and Information Technology - D.GloryRatha Mary,
S.Selvanayahi, Shekina Publications.

REFERENCE BOOKS:

1. Introduction to Computer - Peter Norton, Tata McGraw Hill, 2002
2. Fundamental of Information Technology - Alex Leon& Mathews Leon Vikas Publication – New Delhi, 2009

SEMESTER – IV
CORE SUBJECT – 1
VISUAL BASIC

L T P C
5 0 0 4

COURSE OBJECTIVES:

- To study properties and events, methods of controls and how to handle events of different controls.
- To understand the use of active controls and how to design VB application.
- To study connectivity between VB and databases.

UNIT – 1 GETTING STARTED WITH VISUAL BASIC 6.0

Introduction to Visual Basic, Visual Basic 6.0 Programming Environment, Working with Forms, Developing an Application, Variables, Data types and Modules, Procedure and Control Structures, Array in Visual Basic, Additional examples. Working with Controls: Introduction, Creating and Using Controls, Working with Control Arrays, Additional examples. **(12 L)**

UNIT – 2 MENUS & GRAPHICS

Menus, Mouse Events and Dialog Boxes: Introduction, Mouse Events, Dialog Boxes, Additional examples. Graphics, MDI and Flex Grid: Introduction, Graphics for Applications, Multiple Document Interface (MDI), Using the flex Grid Control, Additional examples. **(12 L)**

UNIT - 3 OPEN DATABASE CONNECTIVITY

ODBC and Data Access Objects: Evolution of Computer Architecture, Data Options, Additional examples. ODBC Using Data Access Objects and Remote Data objects: Open Database Connectivity (ODBC), Remote Data objects, Additional examples. **(12 L)**

UNIT – 4 REPORT CREATION

Data Environment and Data Report: Introduction, Data Environment Designer, Data Report, Additional examples. Object Linking and Embedding: Introduction, OLE Fundamentals, Using OLE Container Controls, Using OLE Automation Objects, OLE Drag and Drop, Additional examples. **(12 L)**

UNIT – 5 ACTIVE X CONTROLS

Built – in Active X Controls: Working with Built – In Active X Controls, Additional examples. Working with Active X Data objects; An Overview of ADO and OLE DB, ADO Object Model, Additional examples. Files, and File System Controls: Introduction, File System Controls, Accessing Files, Interface with Windows, Additional examples. **(12 L)**

COURSE OUTCOMES:

- Demonstrate knowledge of programming terminology and how applied using Visual Basic (e.g., variables, selection statements, repetition statements, etc.).
- Develop a Graphical User Interface (GUI) based on problem description.
- Develop an Event Planning Chart based on problem description so as to define the processing that is to occur based on specific events.

TEXT BOOK:

1. Visual Basic 6.0 Programming – Content Development Group – Tata McGraw hill Publishing Company Limited, New Delhi.
(Chapters 1,2,3,4,5,6,7,8,9,13,16,17)

REFERENCE BOOKS:

1. Microsoft Visual Basic 6.0 Professionals - Michael Halvorson – PHI.
2. Visual Basic 6 in Record Time - Steve Brown, BPB Publications.
3. Visual Basic 6 from the Ground UP – Gary Cornell - Tata McGraw hill.

**CORE SUBJECT – II
E – COMMERCE**

**L T P C
4 0 0 4**

COURSE OBJECTIVES

- To provide adequate basic understanding about Management Education among the students.
- To prepare students to exploit opportunities being newly created in the Management Profession.
- To train the students in communication skills effectively.

UNIT – 1 INTRODUCTION

What is Electronic Commerce? –Types of Electronic Commerce Technology **(12 L)**

UNIT – 2 MODELS AND TYPES

Types of E-Business Models and Markets - Types of E-Commerce Providers and Vendors E-Commerce website Creation. **(12 L)**

UNIT - 3 E-COM WEB DEVELOPMENT

Managing E-Commerce website Development – Building Shopping Cart Applications – Mobile Electronic Commerce. **(12 L)**

UNIT - 4 E-COM DATABASES

Enhancing a web server with E-Commerce Application Development – Strategies, Techniques and tools – Implementing Merchandising Strategies – Implementing E-Commerce Databases. **(12 L)**

UNIT - 5 E-COMMERCE APPLICATIONS

Applying and Managing E-Business Intelligence Tools for Application Development – Types of Security Technologies – protocols for the Public Transport of Private Information. **(12 L)**

COURSE OUTCOMES:

- Design and implement an e-commerce application with a shopping cart.
- Integrate the waterfall model in the development of e-commerce applications.
- Integrate user-centered design guidelines in developing user-friendly websites.

TEXT BOOKS:

1. Electronic Commerce - Pete Loshin and John Vacca, Fourth edition, Firewall Media, New Delhi, 2006.
2. E-Business - Parag Kulkarni, Sunita Jahirabadkar, and Pradip Chande, Oxford University Press, 2013.

REFERENCE BOOKS:

1. Electronic Commerce - Gary O.Schnelder James T.Perry, First edition, Thomson Learning 2000.
2. Electronic Commerce - Elias M.Awad, Prentice Hall of India 2002.

CORE SUBJECT – III
RESOURCE MANAGEMENT TECHNIQUES

L T P C
4 0 0 4

COURSE OBJECTIVES

- To solve optimization problems using simplex method.
- To learn to solve problems in linear programming and Integer programming.
- To use PERT and CPM for problems in project management.

UNIT – 1 LINEAR PROGRAMMING I

Introduction – Advantages and disadvantages of LP – Basic characteristics of LP – General linear Programming problem – Algebraic solution of a LP (Simplex Method). **(10 L)**

UNIT - 2 ASSIGNMENT PROBLEM

Introduction – Definition and Mathematical formulation – Methods of solutions – Application area of AP – Comparison between AP and TP – Basic theorems – Hungarian method – Exceptional cases of AP – AP with restrictions – Multiple optimal solution of an AP. **(12 L)**

UNIT – 3 JOB SEQUENCING & NETWORK MODEL PROBLEMS

Introduction, Basic terms and Notations used in Sequencing – Priority sequencing rules – Gantt Chart – Types of Job sequencing problems. Network models: Introduction – Basic features of Network models – Main advantages of Network models – Network models – Minimum spanning tree algorithm – Shortest route problem – Maximum flow and minimum cost flow problems – Travelling salesman problem as a network model – Unifying model: Minimum cost flow network – Linear programming approach to a network model. **(14 L)**

UNIT - 4 PROJECT MANAGEMENT

Introduction – Basic concepts – Project planning techniques – CPM & PERT techniques – Critical path method – The PERT approach – Expected length of a project - Probability of project completion by due date – cost consideration in project scheduling – similarities and differences in CPM & PERT. **(12 L)**

UNIT – 5 GAME THEORY

Introduction – Definitions and Terminology – Basic game theory models – Fundamental Principles of game theory – Assumptions underlying game theory – Pure strategies: Games with saddle point – The rules of Dominance – mixed strategies: Games without saddle point – Solution of $2 \times n$ and $m \times 2$ Games (graphical approach) – Linear programming solutions of Games. Inventory control: Fundamentals of Inventory theory – Basic terminology – Advantages & disadvantages of Inventory – formula for the quantity to order and lead time – EOQ with price-breaks. **(12 L)**

COURSE OUTCOMES:

- Make use of simplex method to solve optimization problems.
- To find solution for various shortest route problems.
- Utilize PERT and CPM in project management.

TEXT BOOK:

Operations Research Models & Methods – Chandrasekhar Salimath, Bhupender parashar – Universities press 2014.

REFERENCE BOOKS:

1. Operations Research – Nita H. Shah , Ravi M. Gor, HardikSoni – PHI Learning Private Limited, New Delhi, 2009.
2. Operations Research – P.K.Gupta, Dshira, Schand, 2015.
3. Operations Research – H. A Taha, 9th Edition, Pearson, 2014

ALLIED – IV
ACCOUNTING SOFTWARE – TALLY

L T P C
3 0 0 3

COURSE OBJECTIVES:

- This course is designed to impart knowledge regarding concepts of Financial Accounting Tally is an accounting package which is used for learning to maintain accounts.
- As this course is useful for Commerce and computer students to get placements in different offices as well as companies in Accounts departments.

UNIT – 1 CREATING COMPANY IN TALLY

Creating Accounting and Inventory Ledger - creating stock item group, category, pos – Trial balance - Final accounts with adjustments. **(10L)**

UNIT – 2 VALUES DDED TAX

Values added Tax – VAT Rate – VAT classification – VAT composition Report – VAT composite returns – Voucher entry. **(10 L)**

UNIT – 3 TDS, TCS, ST

Features of TDS – TDS Deduction for advance payment & Balance payment – TDS computation report – TCS report Service Tax Reports. **(10 L)**

UNIT – 4 EXISE DEALER

Dealer Excise report – Excise stock register – Bank Reconciliation statement – Ledger creation and effective Date for Reconciliation. **(8 L)**

UNIT – 5 PAYROLL

Payroll info - pay heads –employee groups – salary- unit of a attendance – pay sheet report – payslip pay roll statement – payroll with PF and ESI. **(7 L)**

COURSE OUTCOMES:

- Company Setup & Configurations.
- Charts of Accounts Setup.
- Recording Financial Transactions.
- Financial Reports Analysis.

TEXT BOOK :

Accounting Package Tally 9.0 – A.K. Nanthini, Himalaya Publications, 2008.

REFERENCE BOOK:

Tally 9.0 by Dr. Namrata Agrawal, Professor, NIFS.

**SKILL BASED CORE THEORY
MICROPROCESSOR**

**L T P C
4 0 0 4**

COURSE OBJECTIVES:

- To study about microprocessor Architecture.
- To learn about basic 8085 microprocessor and its operations and applications.
- To do arithmetic manipulations using 8085 processor.

UNIT – 1 MICROPROCESSORS, MICROCOMPUTER AND ASSEMBLY LANGUAGE

Microprocessors – Microprocessors Instruction set and Computer Languages – Computers to single chip microcontrollers. Mention to 8085 assembly language Programming – The 8085 Programming model action Classification – Instruction, data format and storage – How to write, store and execute simple program, Overview of 8085 instruction set. **(12 L)**

UNIT – 2 MICROPROCESSOR ARCHITECTURE AND MICRO COMPUTER SYSTEMS

Microprocessor Architecture and its operations – Memory – Input and Output (I/O) – Example of a Micro Computer System. Microprocessor Architecture and Memory interfacing: The 8085 MPU – Example 8085 based microcomputer - Memory interfacing - Interfacing the 8155 memory. **(12 L)**

UNIT – 3 DATA TRANSFER OPERATION

Arithmetic operations – Logic operations – Branch operations - Writing assembling Language programs – Debugging a program. Programming techniques with additional Instruction: Programming techniques – Counting and Indexing – Additional data transfer and 16-bit arithmetic operations – Arithmetic operations related to memory - Logic operations related to memory - Logic operations – Rotate – Dynamic debugging. **(12 L)**

UNIT - 4 COUNTERS AND TIME DELAYS

Counters Time Delays – Hexa decimal counter. Modulo ten counter – Pulse Wave forms – Debugging counter and time Delay programs. Subroutine: Stack – Subroutine – Restart – Conditional call and Return subroutine concepts. **(12 L)**

UNIT – 5 CONVERSIONS

BCD to Binary conversion – Binary to BCD conversion - BCD to seven segment. LED code conversion – BCD addition – BCD Subtraction – Multiplication- Subtraction with carry. **(12 L)**

COURSE OUTCOMES:

- To write programs to run on 8086 microprocessor-based systems.
- Design system using memory chips and peripheral chips for 16-bit 8086 microprocessor.
- Understand and devise techniques for faster execution of instructions, improve speed of operations and enhance performance of microprocessors.
-

TEXT BOOKS:

1. Ramesh S. Goanker - Microprocessor Architecture Programming and Applications with the 8085 – 5th Edition, Penram International Publisher 2000.
2. Microprocessor and Microcontrollers N. Senthil Kumar, M. Saravanan, S. Jeevananthan. Oxford University Press, 2016

REFERENCE BOOK:

- 1.8085 Microprocessor Programming and Interfacing - N.K.Srinath, PHI Publication, 2005.

**MAJOR PRACTICAL – IV
VISUAL BASIC LAB**

**L T P C
0 0 4 2**

PRACTICAL LIST

1. Design a Desktop Calculator
2. Design of a Color Mixer using basic colors.
3. Create an application to format text inside a text box.
4. Create an application using File controls and use two option buttons to show and hide a picture in the picture box.
5. Create an application to do Matrix Addition using Flex Grid Control.
6. Create an Editor with File and Edit menus using Menu Editor Tool.
7. Create an MDI application with tile and cascade child forms.
8. Create an application to implement OLE Drag and Drop.
9. Create a mailing address database in Access and view the records using Data Control.
10. Create a student database in Access and prepare a Report using Data Report Control.

**ALLIED PRACTICAL IV
TALLY LAB [ACCOUNTING PACKAGE]**

**L T P C
0 0 4 2**

PRACTICAL LIST

- 1(a). Develop a purchase day book as your own data
- (b). Create a sales daybook as your imaginary figures
- (c). Give a format of a petty cash book with your own figure
- (d). Prepare an invoice book with your own figure

2. With trail

1	Capital	50,000
2	Sales	5,50,000
3	Purchases	5,60,000
4	Salaries	2,200
5	Carriage inwards	400
6	Lightings	300
7	Rates & insurance	400
8	Discount earned	500
9	Buildings	30,850
10	Furnitures	6,000
11	Carriage Outwards	500
12	Sundry Debtors	8,000
13	Sundry Creditors	20,000
14	Cash at Bank	12,850

the following particulars, prepare a balance:

3. Prepare a proper Subsidiary book and do the transactions with your own data
4. Prepare a Petty Cash book with your own data
5. Prepare a Balance Sheet of a Software company with your own data
6. Prepare Sales invoice of a medical store with your own data

NON-MAJOR ELECTIVE [CHOOSE ANY ONE]

INTRODUCTION TO INTERNET WITH HTML

L T P C
2 0 0 2

COURSE OBJECTIVES

- To learn the principle of Web page design.
- To visualize the basic concept of HTML.
- To recognize the elements of HTML.

UNIT – 1 INTRODUCTION TO INTERNET

Computer is business – networking – internet - e-mail-gopher-world wide web, Internet Technologies – Internet Browsers. **(6 L)**

UNIT – 2 INTRODUCTION TO HTML

History of HTML - HTML generation and Documents – Tags and Links, Head and Body Section. **(6 L)**

UNIT - 3 DESIGNING

Body Section – Ordered and Unordered List – Table Handling. **(6 L)**

UNIT - 4 INTRODUCTION TO DHTML

Features of DHTML – Defining styles – Working with Colors – Text and Fonts with Style. **(6 L)**

UNIT V FRAMES

Frame set Definition – Nested frames – A web design project – forms. **(6 L)**

COURSE OUTCOMES:

- Understand basic concepts in HTML.
- Create basic web pages.
- Implement a variety of hyperlinks to connect pages and communicate with users via email link.

TEXT BOOK:

World Wide Web Design with HTML - C.XAVIER, McGraw Hill Education, 2017

REFERENCE BOOK:

1. The Complete Reference HTML & CSS - Thomas A.Powell, McGraw Hill Education, 2017

2. Fundamental of the internet and the World Wide Web - Greenlaw and Hepp, TMH Publications. 2008

MS WORD

L T P C
2 0 0 2

COURSE OUTCOMES:

- To identify word processing terminology and concepts, create technical documents, format and edit documents, use simple tools and utilities, and print documents.
- To do Mail merging process.
- To Create and edit a Word document.

UNIT – 1

Introduction to Microsoft word 2007 **(6 L)**

UNIT – 2

Creating a document in Microsoft word 2007 **(6 L)**

UNIT – 3

Working with tables, Charts, Graphics **(6 L)**

UNIT – 4

Additional commands of Microsoft word 2007 **(6 L)**

UNIT – 5

Menu commands of Microsoft word 2007 **(6 L)**

COURSE OUTCOMES:

- Demonstrate fundamental knowledge of MS Word.
- Relate real-life MS Word applications for professional or personal use.
- Develop an informal business letter.
- Apply MS Word techniques to create promotional hand-outs.

TEXT BOOK:

1. Straight to the Point Microsoft Word 2007 - Dinesh Maidasani, Laxmi Publication 2007.

REFERENCE BOOK

1. Microsoft Office 2007: Introductory concepts and techniques - Shelly, Cashman, Cengage Learning Inc, 2007

SEMESTER – V
CORE SUBJECT – I
SOFTWARE ENGINEERING

L T P C
4 0 0 4

COURSE OBJECTIVES:

- To understand the nature of software & software engineering.
- To introduce principles of software development
- To learn about planning, developing, designing testing and validating a project.

UNIT – 1 SOFTWARE AND SOFTWARE ENGINEERING

The Nature of Software – What is Software Engineering? - Software engineering as a branch of the engineering profession – Stack holders in Software engineering - Software quality - Software engineering projects – Activities common to Software projects – Difficult and risk in software engineering as a whole. Review of Object Orientation: What is object orientation/ - Classes and objects – Instance variables – Methods, Operations and Polymorphism – Concepts best define object orientation – Difficulties and risks in programming language choice and object – oriented programming. **(12 L)**

UNIT – 2 DEVELOPING REQUIREMENTS

Domain analysis – The starting point for software projects – Defining the problem and the scope – What is a requirement? – Types of requirements – Some techniques for gathering and analyzing requirements – Managing changing requirements – Difficulties and risks in domain and requirements analysis. **(12 L)**

UNIT – 3 MODELING WITH CLASSES

What is UML? – Essentials of UML class diagrams – Associations and Multiplicity – Generalization – Instance diagrams – More advanced features of class diagrams. Modeling Interactions and Behavior: Interaction diagram – State diagrams – Activity diagrams. **(12 L)**

UNIT - 4 ARCHITECTING AND DESIGNING SOFTWARE

The process of design – Principles leading to good design – Techniques for making good design decisions – Software architecture – Architectural patterns – Writing a good designing document. **(12 L)**

UNIT – 5 TESTING AND INSPECTING TO ENSURE HIGH QUALITY

Basic definitions – Effective and efficient testing – Defects in ordinary Algorithms – Defects in numerical algorithms – Defects in timing and co-ordination. Managing the Software Process: What is project management? – Software process models – Cost estimation – building software engineering teams – Project scheduling and tracking. **(12 L)**

COURSE OUTCOMES:

- An ability to apply knowledge of mathematics, science, and engineering.
- An ability to design and conduct experiments, as well as to analyze and interpret data.
- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- An ability to identify, formulate, and solve engineering problems.

TEXT BOOK:

1. Object Oriented Software Engineering - Timothy C.Lethbridge and Robert Laganier, 2nd Edition, McGraw Hill Education, 2005.

REFERENCE BOOKS:

1. Object Oriented and classical Software Engineering - Stephen, R. Schach, 5th Edition, McGraw Hill Education, 2011.
2. Fundamentals of Software Engineering - Carlo Ghezzi, Medhi Jazayeri, Dino Mandrioli, 2nd Edition, Pearson, 2015.

CORE SUBJECT – II

WEB TECHNOLOGY

L T P C
5 0 0 4

COURSE OBJECTIVE:

- To provide the conceptual and technological developments in the field of Internet and web designing with the emphasis on comprehensive knowledge of Internet, Describe the basic concepts for network implementation.
- To learn the basic working scheme of the Internet and World Wide Web.
- Understand fundamental tools and technologies for web design.

UNIT - 1 INTRODUCTION TO THE WEB

Understanding the Internet and World Wide Web – History of the Web – Protocols Governing the Web – Creating Websites for Individuals and the Corporate World – Web Applications – Writing Web projects – Identification of Objects – Target Users – Web Team – Planning and Process Development – Web Architecture – Internet Standards – TCP/IP Protocol Suite – IP Address – MIME – Cyber Laws. Hyper Text Transfer Protocol (HTTP): Introduction – Web servers and clients – Resources – URL and its Anatomy – Message Format. **(14 L)**

UNIT - 2 HYPER TEXT MARKUP LANGUAGE (HTML)

History of HTML and W3C – HTML and its Flavors – HTML Basics – Elements, Attributes, and Tags – Basic Tags – Advanced Tags – Frames. **(12 L)**

UNIT - 3 JAVA SCRIPT

Introduction – Variables – Literals – Operators – Control Structure – Conditional statements – Arrays – Functions – Objects. **(10 L)**

UNIT - 4 EXTENSIBLE MARKUP LANGUAGE (XML)

Common Usage – Role of XML – Prolog – Body – Elements – Attributes – Validation – Displaying XML – Namespace.XML DTD: XML Schema Languages– Validation – Introduction to DTD– Purpose of DTD – Using a DTD in an XML Document. **(12 L)**

UNIT - 5 COMMON GATEWAY INTERFACE (CGI)

Internet Programming Paradigm – Server – side Programming – Languages for CGI – Applications – Server Environment – Environment Variables – CGI Building Blocks – CGI Scripting Using C, Shell Script – Writing CGI programs – CGI Security – Alternatives and Enhancements to CGI. Servlet: Server – Side Java – Advantages Over Applets - Servlet Alternatives – Servlet Strength – Servlet Architecture – Servlet Life Cycle. **(12 L)**

COURSE OUTCOME:

- Employ fundamental computer theory to basic programming techniques.
- Use fundamental skills to maintain web server services required to host a website.
- Select and apply markup languages for processing, identifying, and presenting of information in web pages.
- Use scripting languages and web services to transfer data and add interactive components to web pages.

TEXT BOOK:

1. Web Technologies - Uttam K. Roy, Oxford University Press 2010.

REFERENCE BOOKS:

1. Web Technology and Design - C. Xavier, New Age International Publishers, 2005.
2. Web Technologies TCP/IP Architecture and Java Programming - Achyut S. Godbole & AtulKahate, Tata McGraw Hill, Second Edition, 2008.
3. Web Technology A Developer's Perspective - N. P. Gopalan, J. Akilandeswari, PHI, 2nd Edition, 2014.

**CORE SUBJECT – III
RDBMS**

**L T P C
6 0 0 4**

COURSE OBJECTIVES:

- To understand relational database concepts and transaction management concepts in database system.
- To write PL/SQL programs that use: procedure, function, package, cursor and Exceptions.
- To Use current techniques and tools necessary for complex computing practices.

UNIT – 1 AN OVERVIEW

Personal database - Client server databases – Oracle 9i An introduction – The SQL*Plus Environment – SQL – SQL*PLUS commands – Sample Databases. Oracle Tables; Naming rules and conventions – Data types – Constraints – Creating an Oracle table – Displaying table information’s – Altering and exiting table – Dropping a table – Renaming a table – Truncating a table. **(12 L)**

UNIT - 2 WORKING WITH TABLES

DML – Adding a new Rows/Records – Customized Prompts – Updating existing rows/records – Deleting existing rows/records – Retrieving data from a table - Arithmetic operations – Where clause – sorting. **(10 L)**

UNIT - 3 MULTIPLE TABLES

Joins – Set operators. Subqueries: Subquery – Top – N Analysis. Advanced features: Views – Subsequences - Synonyms – Index. **(12 L)**

UNIT - 4 PL/SQL: FUNDAMENTALS

PL/SQL: fundamentals – Block structure – Comments – Data types –Variable declaration – Anchored declaration – Assignment operation – Bind variables – Substitution Variables – Arithmetic operators. Control Structures: Control structures – Nested blocks – SQL in PL/SQL DML in PL/SQL – Transaction Control Statements. **(14 L)**

UNIT - 5 PL/SQL CURSORS & EXCEPTIONS

Cursors – Implicit cursors – Explicit cursor – Explicit cursor attributes – Implicit cursor attributes – cursor FOR loops – SELECT ... FOR UPDATE- WHERE CURRENT of clause – cursor with parameters – Exceptions – Exception types – Records, Tables: PL/SQL Records – PL/SQL Tables – PL/SQL Varrays **(12L)**

COURSE OUTCOMES:

- Master the basic concepts and appreciate the applications of database systems.
- Master the basics of SQL and construct queries using SQL.
- Be familiar with a commercial relational database system (Oracle) by writing SQL using the system.

TEXT BOOK:

1. Database System Using Oracle - Nilesh Shah, 2nd Edition, Pearson,2016.

REFERENCE BOOK:

1. Oracle 9i Complete reference - Loney, Koch, Tata McGraw Hill, 2005.

MAJOR ELECTIVE PAPER [CHOOSE ANY ONE]

**ELECTIVE – 1
ARTIFICIAL INTELLIGENCE**

**L T P C
4 0 0 4**

COURSE OBJECTIVES

- To introduce the basic principles, techniques, and applications of Artificial Intelligence.
- Emphasis will be placed on the teaching of these fundamentals, not on providing a mastery of specific software tools or programming environments.
- Assigned projects promote a ‘hands-on’ approach for understanding, as well as a challenging avenue for exploration and creativity.

UNIT – 1 PROBLEM, PROBLEM SPACES AND SEARCH

What is AI? – AI Problems – What is an AI technique – Defining the problem as a state space search – Production system - Production system – Characteristics – Problem Characteristics **(10 L)**

UNIT – 2 HEURISTIC SEARCH TECHNIQUES

Generate and test – Hill Climbing – Best First Search – Problem Reduction – Constraints satisfaction – Means end analysis. **(12 L)**

UNIT – 3 KNOWLEDGE REPRESENTATION

Representations and Mappings – Approaches to Knowledge Representation. Using predicate Logic: Representing simple facts in logic – Computable functions and prediction – Resolution – The basic of resolution – Resolution in Propositional Logic – The Unification algorithm – Resolution in Predicate Logic. **(14 L)**

UNIT – 4 REPRESENTING KNOWLEDGE USING RULES

Procedural versus – Declarative Knowledge – logic Programming – Forward versus Backward Reasoning – Matching. **(12 L)**

UNIT – 5 GAME PLAYING

The Minimax search procedure – Adding Alpha Beta cut offs – Addition Refinements – Waiting for Quiescence – Secondary Searches – Using Book moves. **(12 L)**

COURSE OUTCOMES:

- Knowledge of what constitutes "Artificial" Intelligence and how to identify systems with Artificial Intelligence.
- Explain how Artificial Intelligence enables capabilities that are beyond conventional technology, for example, chess-playing computers, self-driving cars, robotic vacuum cleaners.
- Ability to apply Artificial Intelligence techniques for problem solving.

TEXT BOOKS:

1. Artificial Intelligence - Elaine Rich, Kevin Knight & Shivshankar, Tata McGraw Hill, 2008.
2. Artificial Intelligence and Intelligent Systems – N.P.Padhy, 2005.

REFERENCE BOOKS:

1. Artificial Intelligence: A modern approach - Stuart Jonathan, Russell, Pearson, 2019
2. Introduction to Artificial Intelligence - Rajendra, Akerkar, PHI, 2014.

DESIGN AND ANALYSIS OF ALGORITHMS

L T P C

4 0 0 4

COURSE OBJECTIVES:

- To know the basics of various sorting methods.
- To provide a thorough knowledge of the most common algorithms and data structures.
- To understand the design of algorithms

UNIT – 1 INTRODUCTION

What is performance? – Space Complexity: Components of space complexity. Time Complexity: Components of time complexity – Operation counts – Best, worst Average counts – Step counts. Asymptotic Notations: Introduction – Big Oh Notation – Omega and Theta Notations – Complexity analysis examples **(12 L)**

UNIT – 2 DIVIDE & CONQUER APPROACHES

The Method – Applications [Merge Sort, Quick Sort, Defective chessboard] – Solving recurrence equations – Lower bound complexity. **(12 L)**

UNIT -3 GREEDY METHOD

Optimization problems – The Greedy Method – Applications [Container Loading, Topological sorting, Single Source Shortest Paths] **(12 L)**

UNIT – 4 BACKTRACKING

Method – Applications [Max Clique, Travelling Salesperson, Board Permutation] **(12 L)**

UNIT – 5 DYNAMIC PROGRAMMING

The Method – Applications [Matrix Multiplication chains – All pairs shortest path – Single source shortest path with negative costs] **(12L)**

COURSE OUTCOMES:

- Argue the correctness of algorithms using inductive proofs and invariants.
- Analyse worst-case running times of algorithms using asymptotic analysis.
- Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm.

TEXT BOOK

1. Data Structures, algorithms and applications in Java - Sartaj Sahni, Second Edition, University Press 2005

REFERENCE BOOKS

1. Algorithms - Dasgupta, Papadimitrou and Vazirani, McGraw-Hill Education, 2006.
2. Computer Algorithms - Horowitz, Sahni, and Rajasekaran, Silicon Press, 2007.

CYBER SECURITY

L T P C
4 0 0 4

COURSE OBJECTIVES

- To describe different classes of attacks.
- To describe new and emerging IT and IS technologies.
- To analyze threats and risks within context of the cyber security architecture.

UNIT – 1 INTRODUCTION TO INFORMATION SECURITY

Introduction – The History of Information Security – What is Security – Critical Characteristics of Information – NSTISSC Security Model – Components of an Information System – Securing Components – Balancing Information Security and Access – Approaches to Information Security Implementation – The Systems Development Life Cycle – The Security Systems development life cycle – Security Professional and the Organization – Communities of Interest - Information Security – Is it an Art or a Science. The Need for Security: Introduction – Business Needs First – Threats – Attacks – Secure Software Development. **(12 L)**

UNIT – 2 RISK MANAGEMENT & PLANNING

Introduction – An overview of Risk Management – Risk Identification – Risk Assessment – Risk control Strategies – Selecting a Risk control Strategy – Quantitative versus qualitative risk control practices - Risk Management Discussion Points – Recommended Risk Control Practices. Planning for Security: Introduction – Information Security Policy, Standards and Practices – The Information Security Blueprint – Security Education, Training and Awareness Program – Continuity Strategies. Security Technology: Firewalls and VPNs: Introduction – Physical Design – Firewalls – Protecting Remote Connections. **(12 L)**

UNIT – 3 SECURITY TECHNOLOGY

Introduction – Intrusion Detection and Prevention System (IDS and IPSs) – Honey Pots, Honey Nets and Padded Cell Systems – Scanning and Analysis Tools – Access Control Devices. Cryptography: Introduction – Foundations of Cryptology – Cipher Methods – Cryptographic Algorithms – Cryptographic Tools. **(12 L)**

UNIT – 4 SECURITY IMPLEMENTATION

Physical Security: Introduction – Physical Access Controls – Fire Security and Safety – Failure of Supporting Utilities and Structural Collapse – Interception of Data – Mobile and Portable Systems – Special Considerations for Physical Security Threats. Implementing Information Security: Introduction – Information Security Project Management – Technical Topics of Implementation – Non technical Aspects of Implementation – Information Systems Security Certification and Accreditation. **(12 L)**

UNIT – 5 SECURITY AND INFORMATION SECURITY

Security and Personnel: Introduction – Positioning & Staffing the Security Function – Credentials of Information Security Professionals – Employment Policies and Practices – Security Considerations for Nonemployees – Internal Control Strategies – Privacy and the Security of Personal Data. Information Security Maintenance: Introduction – Security Management Models – The Maintenance Model – Digital Forensics. **(12 L)**

COURSE OUTCOMES:

- Evaluate the computer network and information security needs of an organization.
- Assess cyber security risk management policies in order to adequately protect an organization's critical information and assets.
- Measure the performance of security systems within an enterprise-level information system.

TEXT BOOK:

1. Principles and Practices of Information Security – Dr Michael E. Whitman, CISM, CISSP Herbert J. Mattord, CISM, CISSP – Cengage Learning India Private Limited, Indian fourth edition Reprint , 2010.

MULTIMEDIA

L T P C
4 0 0 4

COURSE OBJECTIVES:

- To define the principles, characteristics and forms of Visual Design in Multimedia Development.
- To define the role of Visual Reading Elements.
- To learn how to use multimedia software.

UNIT - 1 MULTIMEDIA FUNDAMENTALS

Basic concepts - Multimedia applications Design consideration – Multimedia Application Goals & Objectives – Opportunities in multimedia production: Important in Multimedia development Application Design and production. **(12 L)**

UNIT - 2 MULTIMEDIA APPLICATION

Structure and organization: Considering Interface design – Planning the production of your Application – Creating multimedia building blocks. **(12 L)**

UNIT - 3 MULTIMEDIA PRESENTATION

Building blocks: Text - Graphics. **(10 L)**

UNIT - 4 OTHER MULTIMEDIA TOOLS

Multimedia presentation building blocks: video capturing, Sound Capturing and Editing. **(14 L)**

UNIT - 5 STRUCTURE AND FUNCTION OF AUTHORING SOFTWARE

Authoring software, selection of authoring program - Fundamentals of Macromedia Director 5.0 **(12L)**

COURSE OUTCOMES:

- Describe different realizations of multimedia tools and the way in which they are used.
- Analyse the structure of the tools in the light of low-level constraints imposed by the adoption of various QoS schemes (ie bottom up approach).
- Plan experiments to test user perception of multimedia tools.

TEXT BOOK:

1. Multimedia An Introduction- John Villain – Casanova- Louis Molina Prentice – Hall/Macmillan Computer Publishing, Reprint.

REFERENCE BOOK:

1. Multimedia: Making it works - TayVaughan, 6th Edition, Tata MacGraw Hill.

MAJOR PRACTICAL – V

RDBMS LAB

L T P C
0 0 4 2

PRACTICAL LIST

1. Create an employee database with tables department, employee details, address, pay details and project details. After the tables and add constraints relevant to the fields in the tables. Insert records into all the tables.
2. Create queries to retrieve relevant information from a table.
3. Create a table from the existing tables. Create views from the tables.
4. Develop queries to retrieve information from more than one table. Develop summary queries to retrieve relevant information from the table
5. Create a partition table and query the records.
6. Create a PL / SQL Program to print multiplication table.
7. Create a PL / SQL Program to check whether a given string is palindrome or not.
8. Create a PL / SQL Program to print student details using report.
9. Create a PL/SQL Program to update using various triggers.
10. Create a PL/SQL Program to find factorial of numbers using function and procedure.

MINI PROJECT

L T P C
0 0 5 4

OBJECTIVE:

To develop applications in PHP using various concepts like Arrays, udf's, Sessions and make the students to understand and to establish the connectivity between PHP and MySQL and develop programs to add records, retrieve records and delete records from a table.

** Each exercise should be completed within THREE hours.*

** It is compulsory to complete all the exercises given in the list in the stipulated time.*

1. Create a simple webpage using PHP.
2. Design a form to create an email. Store the data in a database. Validate all the input fields. Database connectivity in PHP with MySQL.
3. Create a MySQL database table tbllogin with fields user name and Password. Perform all database operations like select, insert, delete, update on the table tbllogin
4. Develop a CRUD application, which stands for Create, Read, Update, Delete. A quick example of a CRUD application would be a database of employees for a company. From the control panel, an admin would be about to add a new employee (create), view a list of employees (read), change an employee's salary (update) or remove a fired employee from the system (delete).
5. Create a table with two columns namely the name of the player and number of wickets. Create a Chart to display the data.
6. Create your college webpage.
7. Design a biodata form.

SEMESTER – VI

CORE SUBJECT – I OPERATING SYSTEMS

L T P C
4 0 0 4

COURSE OBJECTIVES

- To understand design issues related to process management and various related algorithms.
- To understand design issues related to memory management and various related algorithms.
- To understand design issues related to File management and various related algorithms.

UNIT - 1 INTRODUCTION

What is an Operating System: Mainframe Systems – Desktop Systems – Multiprocessor Systems -Distributed Systems – Clustered Systems – Real – time Systems– Handheld Systems. **(10 L)**

UNIT – 2 PROCESS CONCEPT

Process Concept – Process Scheduling – Operations on Process – Co-operating processes – Inter Processes - Inter Process communication. CPU Scheduling: Basic Concepts – Scheduling Criteria - Scheduling algorithms – Multi processor Scheduling - Real time Scheduling – Algorithms evaluation. **(12 L)**

UNIT - 3 PROCESS SYNCHRONIZATION & DEADLOCKS

Process Synchronization: Background – the critical section problem – Synchronization hardware – Semaphores – Classical problems of Synchronization – critical regions – Monitors – Atomic transaction. Deadlocks: System model – Deadlock Characterization – methods for handling Deadlocks – Deadlock prevention – Deadlock Avoidance – Deadlock detection – recovery from Deadlock. **(14 L)**

UNIT IV MEMORY MANAGEMENT

Memory management: Background – Swapping – Contiguous memory allocation – paging – segmentation – segmentation with paging. Virtual Memory: Background – Demand paging – Page replacement – Allocation of frames. **(12 L)**

UNIT V FILE MANAGEMENT

File System Interface: File concept – Access methods – File system structure – File system implementation – Directories structure - Directory implementation – Allocation methods – Free space management – Efficiency and performance – Recovery. Mass Storage Structure: Disk Structure – Disk Scheduling – Disk management – Swap space management – RAID structure – Disk attachment – Stable Storage. **(12 L)**

COURSE OUTCOMES:

- Master functions, structures and history of operating systems.
- Master various process management concepts including scheduling, synchronization, and deadlocks.
- Be familiar with multithreading.
- Master concepts of memory management including virtual memory.

TEXT BOOK:

1. Operating System Concepts – Abraham Silberschatz and Peter Baer Galvin
Addition Wesley publishing company – 9th Edition , 2018.

REFERENCE BOOK:

1. Operating System: Intel and Design Principles, 7th Edition, William Stallings, PHI, 2012
2. Understanding Operating System, Ida M.Flynn, Ann McIverMchoes.
3. Operating Systems – Second Edition, Achyuts.Godbole, TMH.

**CORE SUBJECT – II
COMPUTER NETWORKS**

**L T P C
5 0 0 4**

COURSE OBJECTIVES:

- To understand the basic networking concepts, types of addresses, data communication, protocols etc.
- To understand wired and wireless networks, its types, functionality of each layer.
- To understand importance of network security and cryptography.

UNIT – 1 NETWORK HARDWARE& SOFTWARE

LAN-WAN-MAN – Wireless – Home Networks. Network Software: Protocol Hierarchies – Design issues for the layers – connection oriented and connection less services – Service primitives – The relationship of services to protocols. Reference Models: OSI Reference Model - TCP/IP reference Model Comparison of OSI and TCP/IP Critique of OSI and protocols – Critique of TCP/IP reference Model **(12 L)**

UNIT – 2 PHYSICAL LAYER

Guided Transmission Media: Magnetic Media: Twisted-Pair Cable, Coaxial Cable, Fiber-Optic Cable, Wireless Transmission: Electro Magnetic Spectrum - Radio Transmission - Microwave Transmission – Infrared and Millimeter Waves – Light waves – Communication satellites: Geostationary, Medium- Earth orbit, Low earth Orbit Satellites – Satellites versus fiber. **(12 L)**

UNIT - 3 DATA LINK LAYER

Error Detection and corrections – Elementary Data – Link protocols - Sliding window protocols, Medium –access control – Sub Layer: Multiple Access Protocols – Ethernet –Wireless LANs – Broad band wireless – Bluetooth. **(12 L)**

UNIT IV NETWORK & TRANSPORT LAYER

Network layers: Routing algorithms – congestion control algorithms. Transport layer: Elements of transport protocols – Internet Transfer protocols: TCP. **(12 L)**

UNIT V APPLICATION LAYER

Application Layer: DNS – Email, network security: cryptography – symmetric key algorithms – public key algorithms - digital signatures. **(12 L)**

COURSE OUTCOMES:

- To master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks.
- To be familiar with wireless networking concepts.
- To be familiar with network tools and network programming.

TEXT BOOK:

Computer Networks – Andrew S Tenenbaum, 4th Edition PHI, 2003
(Unit I – 1.2 – 1.4, Unit II -2.2-2.4, Unit III 4.2-4.6, Unit- IV – 5.2,5.3,6.2,6.5,
Unit-V –7.1,7.2,8.1-8.4).

REFERENCE BOOKS:

1. Computer Networks –Bhushan Trivedi, Oxford University Press.
2. Data communication and Networks –Achut Godbole, 2007 PHI.
3. Computer Networks Protocol, Standards and Interfaces – Uyles Black, 2nd Edition PHI.

**CORE SUBJECT -III
COMPUTER GRAPHICS**

**L T P C
6 0 0 4**

COURSE OBJECTIVES:

- To study various graphical Input and Output devices.
- To study how to manipulate graphics object by applying different transformations.
- To study different algorithms for drawing lines, ellipse, circle parabola etc.

UNIT – 1 INPUT AND OUTPUT DEVICES

Introduction: Application and Operations of Computer Graphics - Graphics Packages – Requirements of a Graphical System – GUI. Common Input Devices – Graphical output Devices Raster Scan Video Principle - Raster Scan CRT Monitors – Color Raster Scan System – Plasma Display – LCD – Hard copy Raster Devices - Raster Scan System – Memory Tube Displays – Plotters – Graphics Accelerators – Coprocessors. **(12 L)**

UNIT – 2 ALGORITHMS

Scan Conversion – Methods – Polynomial Method – DDA algorithms for line drawing Algorithm, Circle, Ellipse, Parabola – Bresenham’s Line Drawing Algorithm – Bresenham’s Circle Drawing Algorithm – Problem of Scan Conversion – Solid Areas – Odd Even Methods – Winding Number Method - Solid Area Filling – Algorithms – Boundary, Flood Fill Algorithm. **(12 L)**

UNIT - 3TRANSFORMATION

Two Dimension Transformations – Translation – Scaling – Rotation – Transformations of Points and Objects – Homogenous Coordinate System and Transformations – Reflection – Shearing – Three Dimension Transformations - Translation – Scaling – Rotation – Reflection – Shearing. **(12 L)**

UNIT - 4 CLIPPING ALGORITHMS

2D Viewing and Clipping – Windows and View Ports – Viewing Transformations – Clipping of lines in 2D – Cohen Sutherland Clipping Algorithms – Visibility – Midpoint subdivision method – parametric Clipping – Polygon Clipping – Sutherland Hodgeman Algorithm – Clipping against Concave windows. **(14 L)**

UNIT V HIDDEN SURFACE ALGORITHMS

Hidden Surface Elimination – Black Face Removable Algorithm Z buffer Algorithm. **(10 L)**

COURSE OUTCOMES:

- Understand the structure of modern computer graphics systems.
- Understand the basic principles of implementing computer graphics primitives.
- Develop design and problem-solving skills with application to computer graphics.

TEXT BOOK:

1. Computer Graphics Multimedia and Animation – Malay K.Pakira – PHI Learning 2008.

REFERENCE BOOK:

1. Computer Graphics – Apurva Desai – PHI –2008.
2. PrabhatAndleigh, Kiran Thakrar – Multimedia system and Design – Prentice Hall 2000.

MAJOR ELECTIVE PAPER [CHOOSE ANY ONE]

ELECTIVE – II

WEB SERVICES

L T P C
4 0 0 4

COURSE OBJECTIVES

- To study XML Technologies & XML Applications.
- To study service-Oriented Architecture (SOA) and Application Integration.
- To study services such as. XML, SOAP

UNIT – 1 INTRODUCTION TO WEB SERVICES

Industry standards, Technologies and Concepts underlying Web Services – their support to Web Services – Applications that consume Web Services. **(12 L)**

UNIT - 2 XML

XML – its choice for Web Services – Network protocols to backend databases – Technologies – SOAP, WSDL – exchange of information between applications in distributed environment – Locating remote Web Services – its access and usage, UDI specification –and Introduction. **(12 L)**

UNIT - 3 WEB SERVICES

A brief outline of web services – conversation – static and interactive aspects of system interface and its implementation, work flow – Orchestration and refinement, Transactions , Security issues – the common attacks – security attacks facilitated within web services quality of services – Architecting of systems to meet users requirement with respect to latency, performance, reliability, QOS metrics, Mobile and wireless services – energy consumption, network band width utilization, portals and services management. **(12 L)**

UNIT – 4 WEB APPLICATIONS

Building real world enterprise application using web services – sample source codes to develop web services – steps necessary to build and deploy web services and client applications to meet customer’s requirement – Easier development, customization, maintenance, transactional requirements, seamless porting to multiple devices and platforms. **(12 L)**

UNIT - 5 WEB DEVELOPMENT

Development of Web Services and applications onto tomcat application server and Axis SOAP server (both are free wares) - Web Services Platform as a set of enabling technologies for XML based distributed computing. **(12 L)**

COURSE OUTCOMES:

- To create secured Web services.
- Develop Web services using a variety of advanced computer languages and applications.
- Create, develop, and test Web services including a mobile application.

REFERENCE BOOKS:

1. Developing Enterprise Web Services: An Architects Guide - Sandeep Chatterjee, James Webber, Prentic Hall,2003.
2. NET web services Architecture and Implementation with .Net - Keith Ballinger, Pearson Education, First Edition 2003.
3. Developing Java Web Services: Architecting and developing secure web services using Java - Ramesh Nagappan, John Wiley and Sons, first edition, 2003.
4. Executive Guide to Web Services - Eric A marks and Mark J Werrell, John Wiley and sons, 2003.
5. Web Services: A managers Guide - Anne Thomas Manes, Addison Wesley, 2003

SOFTWARE PROJECT MANAGEMENT

L T P C
4 0 0 4

COURSE OBJECTIVES

- To outline the need for Software Project Management.
- To highlight different technique for software cost estimation and activity planning.
- To know about what is Software Project Management.

UNIT - 1 CONVENTIONAL SOFTWARE MANAGEMENT

Waterfall Model - Conventional Software Management Performance – Evolution of Software economics - Software economics – Pragmatic software cost estimation – Improving software economics – Reducing software product size – Improving software process – Team effectiveness – Automation through software environments. **(12 L)**

UNIT - 2 VARIOUS STAGES

Lift cycle phases – Engineering and Production stages – Inception, Elaboration, Construction and Transition Phases – Artifacts of the process – The artifact sets – Management, Engineering and Pragmatic artifacts – Model based software Architectures. **(12 L)**

UNIT – 3 WORKFLOWS OF THE PROCESS

Workflows of the process – Software process Workflows – Iteration Workflows – Iterative process planning – work breakdown structures – Planning guidelines – cost & schedule estimation process – iteration planning process – pragmatic planning – Project Organizations & responsibilities. **(12 L)**

UNIT – 4 VARIOUS PROCESSES

Process automation – Tools – The project environment – Project control and Process Instrumentation – The seven-core metrics – Management indicators – Quality indicators – Life cycle expectations – Pragmatic software metrics – Metrics automation – Tailoring the Process – Process discriminates. **(12 L)**

UNIT - 5 MODERN PROJECT PROFILE

Continuous Integration – Early risk resolution – Evolutionary requirements – software management Principles Next generation software economics – Modern Process transitions. **(12 L)**

COURSE OUTCOMES:

- Employ Analytical and Modern project development methodology for the process of project management in delivering successful Real time IT projects.
- Evaluate a project to develop the scope of work, provide accurate cost estimates, software development size, effort, and schedule and network diagram for new program proposals or enhancements to existing Software.
- Understanding and using the risk management analysis techniques that identify the factors that put a project at risk and to quantify the likely effect of risk on project timescales.
- Identifying the resources required for a project and to produce a work plan and resource Schedule.

TEXT BOOKS:

1. Software Project Management - Walker Royce, Pearson Education 2012.
2. Software Project Management - Bob Hughes and Mike Cotterell, Tata McGraw Hill, 2011.
3. Software Project Management in practice - Pankaj Jalote, Pearson Education 2012.

COURSE OBJECTIVES

- To study the need and nature of mobile applications.
- To learn the tools and platforms required for mobile applications.
- To understand the design issues in mobile applications.

UNIT – 1 INTRODUCTION

Mobile Communication: Need for Mobile Communication – Requirements of Mobile Communication – History of Mobile Communication – Properties of Wireless Medium – Radio Propagation – Propagation Coverage Calculation. Introduction to Cellular Mobile Communication: Cellular Structure – Frequency Reuse – System Architecture – Authentication Centre (AUC) – Home Location Register (HLR) – Visiting Location Register (VLR) – Equipment Identify Register (EIR) – Base Station System - Cellular Mobile Communication Switching. **(12 L)**

UNIT – 2 VARIOUS STANDARDS

Mobile Communication Standards: First generation Wireless Networks – Second generation Wireless System – Third generation and Beyond Wireless Systems – Implementation Organization – Regional Organization – Global Organization – Global System for Mobile communication (GSM) – GSM Architecture – Advanced Mobile Phone Service (AMPS) – Digital Advanced Mobile Phone Service. Cordless Telephony Standards: - Personal Access Communication Standards (PACS) – EIA/TIA IS- 136-EIA TIA IS – 95 Standards – Digital European Cordless Telephone (DECT) – Personal Handy Phone System (PHS) – IEEE 802.11 - Other Standards – Handoff Techniques - Handoff Detection and Assignment – Types of Handoff – Mobile controlled Handoff –Network controlled Handoff – Mobile Assisted handoff – Radio Link Transfer– Roaming Management – Connection to Public Telephone Network – Connection from Mobile Unit to a Fixer User, Cellular. System Spectrum: Adaptive channel allocation – Frequency Division – Spectrum Utilization – Channel Reservation for Handoff Calls – Control Channels – Channel Assignment Methods – Channel Borrowing and Sharing – Non – Fixed Assignment Methods – Permanent Cell Splitting – Temporary Cell Splitting. **(12 L)**

UNIT - 3 COMMUNICATION SYSTEMS

Cordless Mobile Communication System: Cordless Telephone Home – Multichannel Cordless Telephone System – Wireless Private Box Exchange History of Data networks – Classification of Mobile Data Networks – Independent Data networks – Shared Mobile Data – Overlay Mobile Data – Cellular Digital Part data (CDPD) System – Architecture of CDPD – Satellite Classification - Earth Orbit Satellites – Medium Earth Orbit Satellite, Low Earth Orbit Global Satellite Communication. Changeover from One Satellite to Requirements of Global Mobile Communication - Global User Number – Configuration – Third Generation Global Mobile System Satellite System for mobility. **(12 L)**

UNIT - 4 INTERFERENCES

Interferences in Cellular Mobile Communication: Nature of Co- Channel Interference – Measurement of Co- Channel Interference - Measurement of Co-Channel Interference with mobile Unit – Frequency Reuse - Co- Channel Interference Omni directional Radiation – directional Antennas for Co- Channel Interference Reduction – Other Methods of Co- Channel Reduction – Non-Co-Channel Interference –Measurement of Signal to Noise and Distortion Ratio (SINAD) – Design Objective – Basic Specification - Co- Channel Interference Reduction Factor – Adjacent Channel Interference – Propagation Attenuation – Fading – Factors to be Considered at the Base Station – Working of Mobile IP – Wireless Threads – Authentication and Access control – Secrecy to Communication – Anonymity – Security Arrangement in CDMA – Security of Wireless Data Networks. **(12 L)**

UNIT – 5 WIRELESS LOCAL LOOP ARCHITECTURE

Components in WLL – Problems in WLL – Modern Wireless Local Loop – Local Multipoint Distribution Service (LMDS) - Properties of WAP – Bearer Services – Wireless Datagram Protocol (WDP) – Wireless Transport Layer Security (WTLS) – WAP Transaction Protocol (WTP) Wireless Session Protocol (WSP) Wireless Application Environment (WAE) – Components Integration – Bearer Adaptation – WAP Client Supporting Networks – System Description – Advantages of Microcellular – Layout of the Optical Fiber Microcellular Communication System – Need for Ad hoc Networks – MANET and Technical Factors Affecting Ad hoc Network - Ad hoc Nodes System Description – Routing in Ad hoc Network – Bluetooth Technology – Limitation on the Bluetooth Physical Layer – Types of Intelligent Cells – Power Delivery Intelligent Cells – Processing Gain Intelligent Cells – User Controlled Services – Reconfigurable Technology – Vision of 4G – 4G Mobile System Convergence. **(12 L)**

COURSE OUTCOMES:

- Apply the knowledge and understand the working, characteristics and limitations of mobile hardware devices including their user-interface modalities.
- Understand and identify the GSM, GPRS and Bluetooth software model for mobile computing.
- Analyze the process of GSM functioning and learn frequency band, spectrum, air interface and channel structure and interpret and compare the functioning of GSM and CDMA technology.
- Understand the impact of mobile communication on society either economic or health related issues.

TEXT BOOK:

1. Wireless and Mobile Communication - T.G.Palanivelu & R.Nakkeeran, PHI Learning Private Limited, 2009.

REFERENCE BOOKS:

1. Wireless and Cellular Telecommunications - Third Edition #William C.Y.Lee, McGraw Hill.
2. Mobile Computing Technology, applications and Service Creation - Asoke Telukder & RoopaR.Yavagal, TMH Publication.
3. Wireless Communications and Networking made simple - Prof. Satish Jain, Vineeta Pillai, BPB Publications.

SYSTEM PROGRAMMING

L T P C
4 0 0 4

COURSE OBJECTIVES

- To understand the design structure of Assembler and macro processor .
- To understand the working of linkers and loaders and other development utilities.
- To study and understand compiler design.

UNIT - 1ASSEMBLERS

General design procedure – design of assembler – statement of problem – Data structure – Format of database – Algorithm – Look for modularity – table processing – Searching and Sorting – Linear search – Binary search – Interchange sort – shell sort – Radix exchange sort – Address Calculation sort – comparison of sorts – hash or random entry searching. **(12 L)**

UNIT – 2 MACROLANGUAGE AND MACROPROCESSOR

Macro instructions – Features of macro facilities – Macro instruction arguments – conditional macro expansion – Macro calls within macro – macro instruction – defining macro – implementation – Two – pass – Algorithm – Single – pass – Algorithm – implementation of macro calls within macros – implementation within an assembler. **(12 L)**

UNIT - 3LOADERS

Loader schemes – Compile and Go General – Absolute Loaders – Subroutine Linkages – Relocating – Direct Linking Loader – Binders - Linking Loaders – Overlay – Dynamic binder – Design of an absolute Loader - Design of direct Linking Loader – specification of problem - specification of Data structure - Format of database – Algorithm. **(12 L)**

UNIT – 4 COMPILER

Statements of problem – recognizing basic elements – recognizing syntactic units and interpreting meaning – Intermediate form – storage allocation – Code generation – General model of compiler. Phases of the Compiler: Lexical Phase – Syntax phase – Interpretation phase – optimization – storage assignment – code generation – assembly phase – passes of a compiler. **(12 L)**

UNIT – 5 PROBLEM MPLEMENTATION

Statement of problem – Implementation – Recursion, call and return statements – storage classes – use - static storage – Automatic storage – Internal controlled storage – External controlled storage – Based storage - Implementation – static storage – Automatic storage - controlled and based storage – Block structure – accessing information for block structure – storage allocation for block structure.
(12 L)

COURSE OUTCOMES:

- Master in using the C/C++ programming language, its constructs and grammar, to create system software.
- Master in the usage of make files, linking, object files, loading, symbol resolution, shared and static libraries, debugging, and execution of system programs.

TEXT BOOK:

1. System Programming - John J. Donavan, Tata McGraw Hill Edition (1991)
Chapters: 3, 4, 5 & 8.

REFERENCE BOOK:

1. System Programming and Operating System - D.M. Dhamdhere, Tata McGraw Hill Publishing Company.

GRAPHICS LAB

L T P C

0 0 4 2

PRACTICAL LIST

1. Write a program so that it should first display the image as the size of applet, then it should be reduced and again it should be reduced and so on and finally the image should disappear.
2. Write a program to scale an image.
3. Write a program to rotate an image.
4. Write a program to drop word by word a sentence from the top.
5. Write a program to draw a line using Bresenham's algorithm.
6. Write a program to draw a line using DDA algorithm.
7. Write a program to display the News Headlines letter by letter.
8. Write a program to display as many balls in the frame in random position.
9. Write a program for bouncing a ball and moving with sound effect.
10. Write a program to create scenery of rain in the frame with sound of rain.

MAJOR PROJECT – [GROUP]

GUIDELINES FOR PROJECT WORK

L T P C

0 0 7 7

COURSE OBJECTIVES:

- The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.
- Each student should carry out group Project Work and it may be a work using the software packages that they have learned or the implementation of concepts from the papers studied or implementation of any innovative idea.
- *The Project work should be compulsorily done in the college only under the supervision of the Department staff concerned.*
- ***Viva-voce will be conducted at the end of VI semester for 100 marks.***