

THIRUVALLUVAR UNIVERSITY

BACHELOR OF SCIENCE

B.Sc. INFORMATION SYSTEM MANAGEMENT UNDER CBCS

(With effect from 2020 - 2021)

The Course of Study and the Scheme of Examinations

S. No.	Part	Study Components		Ins. Hrs / week	Credit	Title of the Paper	Maximum Marks		
		Course Title					CIA	Uni. Exam	Total
SEMESTER I									
1.	I	Language	Paper-1	6	4	Tamil/Other Languages	25	75	100
2.	II	English (CE)	Paper-1	6	4	Communicative English I	25	75	100
3.	III	Core Theory	Paper-1	6	4	Introduction to Information Technology	25	75	100
	III	Core Practical	Practical-1	4	0		0	0	0
4.	III	Allied -1	Paper-1	4	3	(to choose any 1 out of 2) 1. Mathematical Foundations 2. Financial Accounting I	25	75	100
	III	Allied- 1	Practical-1	2	0		0	0	0
5.	III	PE	Paper 1	6	3	Professional English II	25	75	100
6.	IV	Environmental Studies		2	2	Environmental studies	25	75	100
		Sem. Total		36	20		150	450	600
SEMESTER II									
7.	I	Language	Paper-2	6	4	Tamil/Other Languages	25	75	100
8.	II	English (CE)	Paper-2	6	4	Communicative English II	25	75	100
9.	III	Core Theory	Paper-2	5	4	Business Accounting Software	25	75	100
10.	III	Core Practical	Practical-1	3	2	Office Automation Lab	25	75	100
11.	III	Allied-1	Paper-2	4	3	(to choose any 1 out of 2) 1. Statistics 2. Financial Accounting I	25	75	100
12.	III	Allied Practical - 1	Practical-1	2	2	(to choose any 1 out of 2) 1. Mathematical Foundation & Statistics 2. Tally Lab	25	75	100
13.	III	PE	Paper 1	6	3	Professional English II	25	75	100
14.	IV	Value Education		2	2	Value Education	25	75	100
15.	IV	Soft Skill		2	1	Soft Skill	25	75	100
		Sem. Total		36	25		225	675	900

SEMESTER III						CIA	Uni. Exam	Total	
16.	I	Language	Paper-3	6	4	Tamil/Other Languages	25	75	100
17.	II	English	Paper-3	6	4	English	25	75	100
18.	III	Core Theory	Paper-3	3	3	Programming in C	25	75	100
19.	III	Core Practical	Practical-2	3	2	Programming in C Lab	25	75	100
20.	III	Allied -2	Paper-3	4	3	(to choose any 1 out of 2) A. Web Designing B. Business Communication	25	75	100
	III	Allied	Practical	3	-	A. Web Designing Lab B. Business Communication Lab	0	0	0
21.	IV	Skill Based Elective	Paper-1	3	2	E-Business	25	75	100
22.	IV	Non-Major Elective	Paper-1	2	2	Concepts of Internet	25	75	100
		Sem. Total		30	20		175	525	700
SEMESTER IV						CIA	Uni. Exam	Total	
23.	I	Language	Paper-4	6	4	Tamil/Other Languages	25	75	100
24.	II	English	Paper-4	6	4	English	25	75	100
25.	III	Core Theory	Paper-4	4	3	Java Programming	25	75	100
26.	III	Core Practical	Practical-3	3	2	Java Programming Lab	25	75	100
27.	III	Allied-2	Paper-4	4	3	(to choose any 1 out of 2) A. Operations Research B. Cost and Management Accounting	25	75	100
28.	III	Allied Practical	Practical-2	3	2	A. Web Designing Lab & Operations Research Lab B. Business Communication & Cost and Management Accounting Lab	25	75	100
29.	IV	NMSDC : Digital Skills for Employability	Paper-2	2	2	Office Fundamentals	25	75	100
30.	IV	Non-Major Elective	Paper-2	2	2	Management Information System	25	75	100
				30	22		200	600	800
SEMESTER V						CIA	Uni. Exam	Total	
31.	III	Core Theory	Paper-5	6	5	Principles of Management	25	75	100
32.	III	Core Theory	Paper-6	6	5	Data Base Management System	25	75	100
33.	III	Core Theory	Paper-7	6	4	Python Programming	25	75	100
34.	III	Core Practical	Practical-4	3	2	Python Programming Lab	25	75	100
35.	III	Core Practical	Practical-5	3	2	DBMS LAB	25	75	100
36.	III	Internal Elective	Paper-1	3	3	(to choose any 1 out of 3) A. Enterprise Resource Planning B. Bioinformatics	25	75	100

						C. Marketing Management				
37.	IV	Skill Based Elective	Paper-3	3	2	Entrepreneurial Development	25	75	100	
		Sem. Total		30	23		175	525	700	
		SEMESTER VI						CIA	Uni. Exam	Total
38.	III	Core Theory	Paper-8	4	4	Computer Graphics and Web Designing	25	75	100	
39.	III	Core Theory	Paper-9	4	4	Software Engineering	25	75	100	
40.	III	Core Theory	Paper-10	4	4	Multimedia	25	75	100	
41.	III	Core Practical	Practical-6	2	2	Computer Graphics and Web Designing Lab	25	75	100	
42.	III	Core Practical	Practical-7	2	2	Multimedia Lab	25	75	100	
43.	III	Core Project	Paper - 11	5	5	Individual / Group Project	25	75	100	
44.	III	Internal Elective	Paper-2	3	3	(to choose any 1 out of 3) A. Data Analytics with R Management B. Fundamentals of Biological Sciences C. Operating Systems	25	75	100	
45.	III	Internal Elective	Paper-3	3	3	(to choose any 1 out of 2) A. Human Resource Management B. Information Security	25	75	100	
46.	IV	Skill Based Elective	Paper-4	3	2	Business Ethics	25	75	100	
47.	V	Extension Activities		0	1		100	-	100	
48.	-	NMSDC : Employability Readiness	-	-	-	(choose any one) • Naandi • Unnati • Quest • Izpay • IBM Skills build	-	-	-	
		Sem. Total		30	30		325	675	1000	
									4700	

Part	Subject	Papers	Credit	Total Credits	Marks	Total Marks
Part I	Languages	4	4	16	100	400
Part II	Communicative English & English	4	4	16	100	400
Part III	Allied (Odd Semester)	2	3	6	100	200
	Allied (Even Semester)	2	3	10	100	200
	Allied Practical	2	2		100	200
	Electives	3	3	9	100	300
	Core	10	(3-5)	40	100	1000
	Core practical	7	(2-3)	14	100	700
	Professional English	2	3	6	100	200
	Compulsory Project (Group/Individual Project)	1	5	5	100	100
Part IV	Environmental Science	1	2	2	100	100
	Soft skill	1	1	1	100	100
	Value Education	1	2	2	100	100
	Lang. & Others /NME	2	2	4	100	200
	Skill Based subject	4	2	8	100	400
Part V	Extension Activities	1	1	1	100	100
	Total	47		140		4700

THIRUVALLUVAR UNIVERSITY
B.Sc. INFORMATION SYSTEM MANAGEMENT
SYLLABUS UNDER CBCS

(With effect from 2020-2021)

SEMESTER - III
PAPER - 3
PROGRAMMING IN C

UNIT - I

Overview of C: History - Importance of C - Structure of C programs - Keywords and Identifiers - Constants, Variables, Datatypes, Declaration of variables - Types of Operators- Evaluation of Expression - Operator Precedence and Associativity.

UNIT - II

Managing Input - Output Operators, Decision making Branching and Loops: Types of If statement - Switch statement - Conditional operator - Goto statement - While statement-do statement - for Statement - Continue statement.

UNIT - III

Arrays and Strings: One Dimensional Arrays - Two Dimensional Arrays - Read and Write text - String Handling - Two Dimensional Arrays with String - Pointers - Pointers and Arrays.

UNIT - IV

User-defined functions: Need for functions - Basic form of C functions - Category of functions - Handling Non - Integer Functions - Nesting of Functions - Recursion - Access modifiers - ANSI C Functions - Call by Value, Call by Reference.

UNIT - V

Structures and Unions: Definition of Structure - Structure Initialization - Comparison of Structure Variables - Arrays within Structures - Structures within Structures - Structures and Functions - Unions - Pointers and Structures - File Management in C - Dynamic Memory allocation - Files - Sequential and random accessing -command line arguments - fopen(), fclose(), fread(), fwrite()

Text Book:

1. Ashok N. Kamthane, Programming with ANSI and Turbo C, Pearson Education, 2006
2. Dr.P.Rizwan Ahmed, [2016] "Programming IN (ANSI-C) Margham Publication, Chennai.

Reference:

1. Yashvant P. Kanetkar, "Let Us C", BPB Publications, 2002.
2. E. Balagurusamy, 'Programming in ANSI C', Tata McGraw Hill, 2004
3. Byron C Gotfried, Programming with C", Schaums outline series, 2nd edition, Tata McGraw Hill, 2006.
4. S. Thamaraiselvi, G. Murugesahan, "C for all", Anuradha agencies.

5. Robert A. Radcliffe, "Encyclopedia C", BPB Publications.

CORE PRACTICAL -I

PROGRAMMING LAB

IN C

(C - Practical)

1. To find max and min of numbers
2. To generate Fibonacci series
3. npr and ncr
4. Matrix addition and subtraction
5. Transpose of a Matrix Sorting - Bubble Sort
6. Sorting - bubblesort
7. Reverse a string and check for palindrome
8. Counting the number of vowels, consonants, words and white spaces in a line of text
9. Linear Search
10. Binary Search
11. To Store Information of a Student Using Structure
12. Add Two Complex Numbers by Passing Structure to a Function
13. To use Union
14. Copy the contents of a text file onto another file leaving punctuation marks
15. Read a text file and count how many times a given word occurs.

ALLIED - 2

PAPER - 3

A. WEB DESIGNING

UNIT - I

HTML

Markup Language (HTML): Introduction to HTML and HTML5 - Formatting and Fonts - Commenting Code - Anchors - Backgrounds - Images - Hyperlinks - Lists - Tables - Frames - HTML Forms.

UNIT- II

DESIGN

Cascading Style Sheet (CSS): The need for CSS, Introduction to CSS - Basic syntax and structure - Inline Styles - Embedding Style Sheets - Linking External Style Sheets - Backgrounds - Manipulating text - Margins and Padding - Positioning using CSS.

UNIT - III

INTRODUCTION TO JAVASCRIPT

Introduction - Core features - Data types and Variables - Operators, Expressions, and Statements - Functions - Objects - Array, Date and Math related Objects - Input Validation.

UNIT - IV

DOM

Document Object Model - Event Handling - Controlling Windows & Frames and Documents - Form handling and Form validations.

UNIT - V

ADVANCED JAVASCRIPT

Browser Management and Media Management - Classes - Constructors - Object-Oriented Techniques in JavaScript - Object constructor and Prototyping - Sub classes and Super classes - Request and Response Object - AJAX.

Text Books:

1. Harvey & Paul Deitel & Associates, Harvey Deitel and Abbey Deitel, "Internet and World Wide Web - How To Program", Fifth Edition, Pearson Education, 2011.
2. Achyut S Godbole and Atul Kahate, "Web Technologies", Second Edition, Tata McGraw Hill, 2012.
3. Thomas A Powell, Fritz Schneider, "JavaScript: The Complete Reference", Third Edition, Tata McGraw Hill, 2013.
4. Jennifer Niederst(1999) Web Design in a Nutshell, Shroff Publishers Pvt. Ltd, Mumbai

ALLIED - 2

PAPER - 3

B. BUSINESS COMMUNICATION

Objective:

To enable the students to know about the Principles, Objectives and Importance of Communications.

UNIT - I

Features of Business Communication - Importance of Effective Communication in Business - classification of communication - Characteristics (7cs) and guidelines of effective business communication.

UNIT - II

Analysis of business letters - Basic principles in drafting - Appearance, Structure and Layout - letter styles.

UNIT - III

Various types of business letters - Letters of enquiry - offers, Quotations, orders, complaints and settlement, circular letters, status enquiry, collection letters, application for jobs CV, resumes and reference letters.

UNIT - IV

Company correspondence - Correspondence with shareholders, Debenture and Fixed deposit holders.

UNIT - V

Bank and Insurance correspondence, Correspondence with Government departments - Modern methods of correspondence - e-mail, internet, Fax, Video conference and their importance.

Reference Books:

1. Rajendra pal and J.S.Korlahalli Essentials of Business Communication - Sultan Chand & Sons, NewDelhi.
2. Bovee, Thill, Schatzman 7th Edition pearson publication, NewDelhi.
3. Shirley Taylor Communication for business pearson publication, NewDelhi.

**ALLIED
PRACTICAL
WEB DESIGNING LAB**

Web Designing:

1. Design a web page having suitable background colour and text colour with title “My First Web Page” using all the attributes of the Font tag and also load an image.
2. Create a web page, showing an ordered list of all second semester courses (Subjects). and showing an unordered list of names of all the skill-based Programmes (Branches) in your institution.
3. Create a HTML document giving details of student information in a table format with proper alignment
4. Create a web page which divides the page in two equal frames and place the audio and video clips in frame-1 and frame-2 respectively. Also provide Link from one Frame to another.
5. Create a web page with all types of Cascading style sheets.
6. Create a script that asks the user for a name, then greets the user with “welcome” and the username on the page
7. Create a script that collects numbers from a page and then adds them up and prints them to a blank field on the page.
8. Create a script that will check the field in Assignment 1 for data and alert the user if it is blank. This script should run from a button.
9. Write a function in java script that takes a string and looks at it character by character
10. Create a simple dynamic web page and implement form validation.

**ALLIED
PRACTICAL
BUSINESS COMMUNICATION LAB**

(Internet Practical)

1. To create a dialup connection for internet
2. To create an e-mail account
3. To create & send an e-mail
4. Message Forwarding & Sending e-mail to multiple address.
5. Chatting using internet.

Reference Books:

1. Electronic Mail - Jacob Palme

SKILL BASED ELECTIVE - I

PAPER – 1

E-BUSINESS

UNIT-I

Introduction to E-Business: Definition - Characteristics of e-Business - E-Business Requirements - Benefits - Advantages and Disadvantages - E-Business Categories: E-Auction - E-Banking - E-Commerce - E - Directories - E-Engineering- E-Franchising - E-Gambling E-Learning - E-Mailing - E-Marketing - E-Supply - E-Trading

UNIT - II

E-Commerce Framework - Traditional vs. E-Business Applications - Architectural Framework - The Internet as Network Infrastructure - Major Categories of E-Commerce - B2C, B2B, C2B and C2C. - Overview of Communication Network - Communication Processors - Communication Media - Communication Satellite - Wireless Networks - Wireless Internet Access ISDN - Dial-Up -Broadband.

UNIT-III

Firewalls and Securities

OSI Models - Network Security and Firewalls - Protocols - Types - Client Server Network Security - Data and Message Security - Digital Signature, Certificates, Envelopes - Encrypted Documents.

UNIT-IV

EDI in Business

E-Commerce and World Wide Web - E-Payment Systems - Electronic Data Interchange (EDI) - EDI Applications in Business, Intranet Application in Business.

UNIT-V

E-Payment Systems

Online Payment - Payments Cards - Electronic Cash - Electronic Wallets - Digital Cards - Types - Stored Value Cards - Internet Technologies

TEXT BOOK

1. R.Kolkota and A.B.Whinston: Frontiers of Electronic Commerce, New Delhi, Addison Wesley,1996.
2. Dr.P.Rizwan Ahmed, [2015], E-Commerce and E-Business, MarghamPublications, Chennai.
3. The Complete E-Commerce Book: Design, Build & Maintain a Successful Web-

based Business Paperback - Import, 30 Mar 2004 by JaniceReynolds

NON-MAJOR ELECTIVE

PAPER-1

CONCEPTS OF INTERNET

UNIT- I

Introduction to Computers Programming Language types - History of Internet - Personal Computers History of World Wide Web- Micro software .NET Java-Web resources.

UNIT - II

Web Browsers- Internet Explorer- connecting to Internet Features of Internet explorer 6 - Searching the Internet- online help and tutorials- File Transmission Protocol (FTP) - Browser settings - Attaching a file, Electronic mail Creating an E-mail id Sending and Receiving mails- attaching a file-Instance Messaging (IM)

UNIT - III

HTML - Introduction - Structure of HTML document- Linking-Basic Tags in HTML - Images-Special characters and line breaks-Line Break -Unordered Lists - Simple HTML Programs

UNIT- IV

DHTML - Dynamic HTML - Introduction - Cascading style sheets - Servlets - Deployment of simple servlets - Web Server(Java web server/Tomcat/web logic) - HTTP GET and POST Requests - Session - Cookies- JDBC connectivity.

UNIT - V

E-Marketing -Consumer Tracking-Electronic Advertising (E-Advertising)- Search Engine-Customer Relationship Management (CRM)-Online Payments-Credit Card Payments-Digital Cash-E-Wallet-Micropayments

Text Books

1. H.M.Deital, P.J. Deital and A.B.Goldberg, Internet and World Wide WebThird edition, Prentice Hall of India, New Delhi.
2. Dr.P.Rizwan Ahmed, Internet and its Applications, Margham Publications,Chennai.

Reference

1. The Internet- Complete Reference Harley Han, Tata McGraw hill

SEMESTER IV
PAPER - 4
JAVA PROGRAMMING

UNIT- I

Introduction to Java - Features of Java - Object Oriented Concepts - Data Types - Variables - Operators - Control Statements- Arrays - String Handling; Special String Operations; Character Extraction; String Comparison; Searching Strings; String Modification; String Buffer

UNIT- II

Classes - Objects - Constructors - Overloading method - Access Control - Static and fixed methods - Using this - Inner Classes - Inheritance - Types of Inheritance -Overriding methods - Using super - Abstract class - Type Wrapper classes for primitive types - Auto boxing and auto Unboxing - Recursion.

UNIT- III

Packages - Access Protection - Importing Packages - Interfaces - Exception Handling - Throw and Throws - Multithreading - Thread - Runnable Interface - Thread Priority - Synchronization - Inter thread Communication- I/O Packages

UNIT- IV

Collections Framework - Iterators - Interfaces- Utility classes - AWT: Frame - Panel -Event - Event Handling - Listener Interfaces- controls - Layout Managers - Graphics Contexts and Graphics Objects - Color Control - Font Control - Menus with Frames.

UNIT- V

Applets: Life Cycle - lode an Image and audio files - Passing Parameters - Swing: Swing Features - Heirarchy Of Java Swing Classes - Swing GUI Components - Swing Control Classes & Methods - JDBC.

Text Books:

1. Dr.P.Rizwan Ahmed, [2016] Java Programming, Third Edition, Margham Publications, Chennai.
2. Balaguruswamy,E[2000], “Programming with Java -A Primer”, Second Edition, Tata McGraw Hill Publishing Company, New Delhi.

References:

1. Herber Schildt,[2002]. “The Complete Reference - Java 2”, Fifth Edition, Tata McGraw Hill Publishing Company , Delhi.
2. Java How to Program by Deitel & Deitel - 6th Edition- PHI Publication 2005.

COREPRACTICAL III

JAVA LAB

1. Writing Java programs by making use of class for the following
 - a. Simple Arithmetic Calculation.
 - b. Decision making
 - c. Looping Statement
 - d. Command line arguments
 - e. This keyword
2. Writing Java programs by making use of class, interface, package, etc for the following
 - a. Interfaces
 - b. Different types of Inheritences
 - c. Function overloading and overriding
 - d. Dynamic Method Dispatch
 - e. Creation of user specific packages
3. Implement String Manipulation
4. Develop a simple application to handle checked and Unchecked exception
5. Develop a simple multithread Application using Thread class and Runnable Interface
6. Writing window based GUI applications using frames and applets such as simple arithmetic Calculator application.
7. Develop a simple GUI application to draw various shapes and handling events
8. Create a simple CUI application to load an Image and Audio Files
9. Create a Personal Information System using Swing.

ALLIED - 2

PAPER - 4

A. OPERATIONSRESEARCH

UNIT – I

Development of OR - Defining of OR - Modeling - Characteristics and Phases - Tools Techniques and Methods - Scope of OR.

UNIT - II

Linear Programming Problem - Formulation - Slack and Surplus variables - Graphical Solution of LPP-Simplex Method - Computational Procedure - Artificial variables techniques - Big M Method and Two PhaseMethod.

UNIT - III

The Transportation and Assignment problem: A streamlined simplex method for the transportation problem, the assignment problem, algorithms for assignment problem.

UNIT - IV

Network Analysis: PERT/CPM - Basic concepts, preparation of network diagram computation of critical path, PERT cost, applications of PERT, Limitations of PERT/CPM.

UNIT - V

Game Theory Introduction - Two person zero sum game - Basic terms - Games with saddle point games without saddle point - Graphical solution - Dominance property - Arithmetic method - General Solution of $m \times n$ rectangular game.

TEXT BOOKS:

1. Looma. N.P [1999] “LinearProgramming”.
2. Sharma. J.K, “Operation Research, Theory”, Macmillan,India.
3. Taha, H.A [2002], “Operations Research an Introduction”, Prentice - Hall of India, NewDelhi.
4. Operation Research by Kanti Swarup P.K.Gupta and ManMohan sultan Chand and sonsPublication.

REFERENCES:

1. Hiller, L.S. and G.J. Lieberman, [2001], “Introduction to Operations Research”, McGraw Hill Pub.Co., Singapore.
2. Sharma. J.K [2003], “Operations Research - Theory and Application”,Macmillan

WEB REFERENCES:

1. http://en.wikipedia.org/wiki/Operations_research
2. http://en.wikipedia.org/wiki/Linear_programming
3. http://en.wikipedia.org/wiki/tit_tat
4. http://en.wikipedia.org/wiki/simplex_algorithm

B. COST AND MANAGEMENT ACCOUNTING

UNIT - I

Cost Accounting - Meaning, Definition, Nature and Scope - Objectives - Advantages and limitations - Elements of cost - Financial versus Cost Accounting. Cost System - Types of costing and Cost classification, cost unit- cost centre and profit centre.

UNIT - II

Material Cost: Meaning of material, need of material control - essential material control- advantages, limitations. Store records - purchase order - methods of pricing - issues of material. Methods - FIFO- LIFO - Simple Average- weighted average - Goods Received note - Bin Card - Store Ledger- Purchase, receipts and inspection - Inventory control - EOQ - ABC Analysis.

UNIT - III

Labor: Meaning of Labor - Importance of Labor, labor cost control, Causes, methods of measurement and reduction of labor turnover - Idle time and over time- methods of wage payment - time rate system - piece rate system: Taylor's, Merricks and Gantt's Task - Premium bonus system - Halsey plan, Rowan plan. Over head: classification of overheads- primary distribution overhead - secondary distribution overheads - direct distribution and continued distribution methods.

UNIT - IV

Management Accounting: Meaning, Definition, Objectives, function, advantages and limitation - difference between management accounting and financial accounting - difference between management account and cost accounting- financial statements - comparative and common size statements - Trend analysis.

UNIT - V

Fund flow statement: Meaning - uses of fund flow statement - schedule of changes in working capital - fund flow statement - cash flow statement: meaning - uses - difference between fund flow and cash flow statement - preparation of cash flow statement.

Theory:60% Problem:40%

REFERENCE BOOKS:

1. Cost and Management Account -Y.Hari Prasad Reddy, T.S. Reddy - Margam Publications
2. Cost and Management Accounting -S.P.Jain and K.L.Narang- Kalyani Publishers.
3. Cost and Management Accounting -S.N.Mageshwari-Sulthan Chand
4. Cost and Management Accounting -A.Murthi. -S.V.Publications.

ALLIED PRACTICAL - II

OPERATION RESEARCH

(O.R Practical)

1. Formulating and solving Linear Program Models [LPM] on a simple spreadsheet such as maximizing revenue - minimizing cost - operating under constraints.
2. Formulating strategies for transporting finished goods formarkets.
3. Traveling salesmanproblem.
4. Computation of critical path for aproject.
5. Computation and applications for gameTheory.

REFERENCES:

1. Hiller, L.S. and G.J. Liebarman, [2001], "Introduction to Operations Research", McGraw Hill Pub.Co.,Singapore.
2. Sharma. J.K [2003], "Operations Research - Theory and Application",Macmillan

COST AND MANAGEMENT ACCOUNTING

(Cost and Management Accounting Practical)

1. Prepare FIFO with the help of your own data.
2. Prepare LIFO with the help of your own data.
3. Prepare Simple Average with the help of your own data.
4. Prepare Weighted Average with the help of your own data.
5. Preparation of Overhead with primary distribution.
6. Preparation of Overhead with secondary distribution.
7. Calculated comparative balance sheet with your imaginary figure.
8. Prepare common size statement with imaginary figure.
9. calculate trend analysis
10. Preparation of fund flow statement with imaginary figure.
11. Preparation of cash flow statement with imaginary figure.

REFERENCE BOOKS:

1. Cost and Management Account -Y.Hari Prasad Reddy, T.S. Reddy - Margam Publications
2. Cost and Management Accounting -S.P.Jain and K.L.Narang- Kalyani Publishers.
3. Cost and Management Accounting -S.N.Mageshwari-Sulthan Chand
4. Cost and Management Accounting -A.Murthi. -S.V.Publications.

SKILL BASED SUBJECT
PAPER - 2
COMPUTER NETWORKS

UNIT-I

Computer networks - Network hardware- Network software- Protocol Hierarchies - Layering - Interfaces, services, primitives - OSI reference Model - TCP/IP reference model - physical layer - transmission media - Wireless transmission -switching.

UNIT - II

Data link layer: services of DLL - framing - flow control - error control - Error detection codes - Error correction codes - DLL protocol - stop and Wait protocol - sliding window protocol - HDLC - DLL in the internet

UNIT-III

Network layer: services of network layer - routing - shortest path routing Algorithm - congestion control - general principle of congestion control Inter network routing - Network layer in the internet - IP protocol -IP address - subnets - internet control protocol

UNIT-IV

Transportation layer: services of transportation layer - addressing -Establishing and releasing connection - flow control - buffering -Multiplexing - the internet transportation protocol TCP and UDP -Model - connection management - TCP congestion control - UDP

UNIT-V

Application layer - DNS - name space - resource - records - name Servers - Email - architecture and services - user agent - message Format and transfer - USENET implementation - WWW client and Server sides - locating information on the web

TEXTBOOKS:

1. Computer Networks - Andrew S. Tanenbaum, 4th edition, PHI.
(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. Data Communication and Network- Achyut Godbole, 2007, TMH.
2. Computer Network Protocols, Standards, and Interfaces - Uyles Black, 2nd ed, PHI.

NON-MAJOR ELECTIVE

PAPER-2

MANAGEMENT INFORMATION SYSTEM

UNIT-I

Management Information: Meaning of Information - Attributes of Information - Information needs of Managers - Web databases - Data warehousing - Knowledge Management - Information System for decision making.

UNIT - II

Types of Information systems: Transaction Processing Systems - Office automation systems - Decision Support Systems - Executive Support Systems - Management Information systems: Evolution of MIS - Computers and MIS.

UNIT - III

System Analysis - System planning and the mutual investigation - System design - The process and stages of system design - Input/output forms design - File Organization - System implementation.

UNIT - IV

Management information needs and communication links for marketing system, Production system, Accounting System, Manufacturing system, inventory control system and budgetary control system - IS organization - Top managements responsibility - Data Processing group's responsibility.

UNIT - V

Development, maintenances of MIS - Operation of manual information system, Role of Computer in MIS - Database concepts, Expert systems - System audit.

Text Books:

1. Rizwan Ahmed, Management Information System, Margham Publications, Chennai.
2. Effy Oz, "Management Information Systems", Second edition, Thomson Learning Course Technology, 2002.
3. Jawadekar W.S, "Management Information Systems", Tata McGraw Hill Publishing Company Ltd, 2002.

Reference Books:

1. David Knoenke (1989), "Management Information Systems", Tata McGraw Hill, New Delhi.
2. Iandon K.C and Landon J.P (2001), "Management Information Systems", Maxwell Macmillan Publishing Company.
3. Murdic Rose and Elaggett, "Information System for Modern Management, Prentice Hall.
4. Robert Schultheis, Mary Sumner, "Management Information Systems" - The Manager's View, Fourth edition, Tata McGraw Hill Edition, 1999.

SEMESTER V

PAPER - 5

PRINCIPLES OF MANAGEMENT

UNIT - I

Fundamentals of Managements - Basic Principles and Process of Management and administration - Planning - Distinguishing between operational and Strategic Planning.

UNIT - II

Functions of Managers: Planning - Organizing - Staffing - Leading - Controlling Control techniques and Information technology.

UNIT - III

Levels of Managements: Top-Level Managers - Middle-Level Managers - First-Level Managers - Time Spent in carrying out Managerial Functions.

UNIT - IV

Management Skills and Organizational Hierarchy: Technical Skills - Human Skills - Conceptual Skills - DesignSkills.

UNIT - V

Approaches to Management: methods for performing jobs-select workers with appropriate abilities for each job - Training for standard task- planning work and eliminating interruptions - wage incentive for increase for increaseoutput.

TEXT BOOKS:

1. Koontz Harrold and weihrich Heinz [1990], “Essentials of Management - McGraw Hill, FifthEdition.
2. Tripathy and P.N.Reddy [1992]: Principles of Management, Tata McGraw Hill, New Delhi.

REFERENCES:

1. Button Gene and Thakur Manab [1996], “Management Theory - Principles and Practice”, Tata McGraw Hill, New Delhi.
2. Chandra Bose [2001], “Principles of Management and Administration”, Prentice Hall of India, Delhi.
3. Robbins [2002], “Management”, 7th Edition, Pearson Education,Delhi.

PAPER - 6
DATABASE MANAGEMENT SYSTEM

UNIT - I

Introduction: Database - Definition of DBMS - purpose of Database - Overall System structure - Entity Relationship model - Mapping constraints - E.R Diagrams

UNIT - II

Relational Model - Structure - Formal Query Language - Relational Algebra - Tuple and Domain Relational Calculus.

UNIT - III

Oracle: Data types - SQL - Data Definition Language (DDL): Creating table - Altering table - Truncating Table dropping a table. Data Manipulation Language (DML): Insert, select, update and delete command. Transactional Control Language: commit, Rollback. Data Control Language: Grant and Revoke privileges

UNIT - IV

Joins - simple join, self join, Outer join. Set Operators - Union, Union all, Intersect, minus. Integrity Constraints - Unique, primary key constraints, Not Null, check constraint.

UNIT - V

PL/SQL : PL/SQL blocks - procedures - functions - Cursor management - triggers- Exception Handling.

TEXT BOOKS:

1. Singh - Database System : Concepts, Design & Applications, Pearson Education.
2. Abraham Silberschatz, H.F.Korth and S.Sundarshan- Database system concepts- Mcgraw Hill Publications.
3. Michael Abbey And Micael. J.Corey- Oracle - A Beginners guide.TMH

WEB REFERENCES

1. <http://www.cs.sfu.ca/CourseCentral/354/zaiane/material/notes/contents.html>
2. www.tutorialspoint.com/dbms/
3. www.studytonight.com/dbms/
4. codex.cs.yale.edu/avi/db-book/db6/slide-dir/

PAPER – 7
PYTHON PROGRAMMING

UNIT - I

Data Types and Data Structures: Introduction to Python: - using the Python interpreter, Overview of programming in Python, Python built-in types, Arithmetic in Python, Program input and Program output, Variables and assignment. Strings and string operations, List basics, List operations, Dictionaries, Dictionary basics and Tuples

UNIT - II

Control Structures: Control Statements: -if statements, while statement, for statements, functions, formal arguments, variable-length arguments, Exceptions, detecting and handling exceptions.

UNIT - III

Classes, files and modules: Introduction to Classes and Objects: -classes, class attributes, instances, instance attributes, binding and method invocation, inheritance, polymorphism, Built-in functions for classes and instances.

UNIT - IV

Files and input/output, reading and writing files, methods of file objects, using standard library functions, dates and times

UNIT - V

Database and web programming - Python database application programmer's interface (DB- API), connection and cursor objects, Type objects and constructors, python database adapters.

TEXT BOOKS

1. Core Python Programming by Wesley J. Chun, 2nd Edition , Pearson Education
2. An Introduction to Python by Guido Van Russom, Fred L.Drake, Network Theory Limited.

REFERENCES

1. Beginning Python: From Novice To Professional By Magnus Lie Hetland, Second Edition.
2. Programming in Python 3 by Mark Summerfield, Pearson Education
3. Online version of An Introduction To Python
4. <http://www.network-theory.co.uk/docs/pytut>
5. <http://docs.python.org/tutorial/>
6. www.spoken-tutorial.org

CORE PRACTICAL III
PYTHON PROGRAMMING LAB

1. Simple Arithmetic Calculation.
2. Decision making
3. LoopingStatement
4. StringManipulation
5. Create SimplePackage
6. Implementing thread using threadclass
7. Working with Colors andFonts
8. Drawing various shapes using GraphicalStatement
9. Usage of Buttons, Labels, Text Components in suitableapplication.

CORE PRACTICAL IV

DBMS LAB

RDBMS (Oracle Lab)

1. Create a table Student-master with the following fields client_no,name, address, city, state,pincode,remarks,bal_due with suitable data types. a) Create another table supplier_table from client_master. Select all the fields and rename client_no with supplier_no and name with supplier_name. b) Insert data into client_master c) Insert data into supplier_master from client_master. d) Delete the selected row in theclient_master.
2. Create a table sales_order with s_order_no and product_no as primary key. Set other fields to store client number, delivery address, delivery date,order status. a) Add a new column for storing salesman number using ALTER Command. b) Set the s_order_no as foregin key as column constraints. c) Set the s_order_no as foreign key as table constraints. d) Enforce the integrity rules usingCHECK.
3. Create a table student_master with the following fields name, regno, dept and year with suitable data types. Use Select command to do the following. a) Select the student's name column. b) Eliminate the duplicate entry in table. c) Sort the table in alphabetical order. d) Select all the Students of a particulardepartment.
4. Create a table sales_order_details with the s_order_no as primary key and with the following fields: product_no, description, qty_ordered, qty_disp,product_rate, profit_percent, sell_price, supplier_name. a) Select each row and compute sell_price*.50 and sell_price*1.50 for each row selected. b) Select product_no, profit_percent, Sell_price where profit_per is not between 10 and 20 both inclusive. c) Select product_no, description, profit_percent, sell_price where profit_percent is not between 20 and d) Select the suppliername and product_no where suppliername has 'r' or 'h'as secondcharacter.
5. Create a table master_book to contain the information of magazine code, magazine name, publisher. Weekly/biweekly/monthly, price. Write PL/SQL block to perform insert, update, delete operations on the abovetable.
6. Create a table to contain phone number, user name, address of the phone user. Write a function to search for a address using phonenumbers.
7. Create a table stock to contain the itemcode, itemname, current stock, date of last purchase. Write a stored procedure to seek for an item using itemcode and delete it, if the date of last purchase is before 1 year from the current date. If not, update the currentstock.
8. Create a table to store the salary details of the employees in a company. Declare the Cursor to contain employee number, employee name and net salary . Use Cursor to update the employeesaralaries.

9. Create a table to contain the information about the voters in a particular constituency. Write a proper trigger to update or delete a row in the table.

10. Create a table to store the details of the Alumnus in an institution. Write a PL/SQL block to change address of a particular alumni. Write proper exceptions and appropriate error messages.

TEXT BOOKS:

1. Singh - Database System : Concepts, Design & Applications, Pearson Education.
2. Abraham Silberschatz, H.F.Korth and S.Sundarshan- Database system concepts- McGraw Hill Publications.
3. Michael Abbey And Micael. J.Corey- Oracle - A Beginners guide. TMH

ELECTIVE SUBJECT

PAPER - 1

A. ENTERPRISE RESOURCEPLANNING

UNIT - I

Business function and Business process: Functional areas and Business Process - functional area of operations - Business process - Marketing Sales - supply chain management - Accounting and finance - Human Resource - Functional areas of information system - The development of ERP system SAP R/3 - New directions in ERP - significance and benefits of ERP software and systems.

UNIT - II

Marketing information system and sales order process in ERP: sales and Distribution in ERP - Pre sales activities - sales order processing - inventory Sourcing - Delivery - Billing - payment - Customer relationship Management - benefits of CRM.

UNIT - III

Production and supply chain management information system: Production overview - The production planning process - The SAP ERP Approach to production planning - Sales forecasting - sales and operation Planning - Demand management - Material requirement planning in SAP ERP - ERP and supplier - Supply chain

UNIT - IV

Accounting in ERP: Accounting activities - using ERP for accounting Information - operational decision making problem - credit management - Industrial credit management in SAP ERP - product profitability analysis - Management reporting with ERP system - Document flow for customer Service.

UNIT - V

Human resource process in ERP: HR with ERP - Advance HR features - Time management - Payroll - Travel management - Training and Development - Management by objectives - ERP processmodeling.

TEXT BOOKS

1. ELLEN MONK and BRET WAGNER, ENTERPRISE RESOURCE PLANNING- 3rd edition -MGH.
2. Dr.P.Rizwan Ahmed, Enterprise Resource Planning, Margham Publications,Chennai.

B. BIO -INFORMATICS

UNIT - I

Protein; Characterization of protein molecules - sedimentation analysis molecular exclusion, chromatography and SDS gel electrophoresis. Determination of amino acid sequence of proteins. Chemical synthesis of peptides.

UNIT - II

Denaturation and renaturation, orders of protein structure, primary and secondary structures - α - helix, β sheet and β - turns. Tertiary structure - α and β .

UNIT - III

Nucleic acids and DNA double helical, Watson and Crick Model. A,B,Z, forms. Triple and Quadruple structures. Concepts of Replication, transcription and translation.

UNIT - IV

Molecular markers for mapping. RFLPs, Chromosome walking. STS and ESTs, positional cloning, SAGE and Cluster analysis. Software programmes and database tools. Sequence analysis at whole genome level: BCRs. ACRs, orthologues, paralogues orphan genes.

UNIT - V

Scope of bioinformatics, useful search engines, Boolean searching, uses of Nucleic acid databases, protein sequences [NCBI, Swiss port, Beranda] using of software like FASTA and BLAST, HEX, Vasmol, Swiss PDB, Arguslab.

TEXTBOOKS:

1. Lesk, A.M., [2002], "introduction to Bioinformatics", Oxford Uni. Press, NewDelhi.
2. Lewin, B.,[2000], "Genes VIII". Oxford Uni. Press, NewDelhi
3. Ranga, M.M.,[2004], " Bio informatics", Panima Book Publishing Company,New Delhi.

REFERENCES:

1. Primrose,[2003], " Principles of genome analysis", BlackwellScience.
2. Campbell and Heyer, [2002], " Discovering genomics, proteomics and bioinformatics", Cold spring Harbor Laboratory Press,
3. Nicholl, D.S.T., [2002], " An introduction to genetic engineering". 2nd Edition. Cambridge university Press,

WEB RESOURCES:

1. <http://www.ensembl.org>
2. <http://www.ncbi.nlm.nih.gov/genbank>

3. <http://www.proteinstructure.com>

C. MARKETINGMANAGEMENT

UNIT - I

Fundamentals of marketing - Role of marketing - Relationship of marketing with other functional areas - Concept of marketing - various definitions of marketing- Marketing management of product services and selling - Marketing approaches - various environmental factors affecting the marketing functions.

UNIT - II

Buyer Behavior - consumer goods and Industrial goods - Buying motives - Buyer Behavior model- Factors influencing buyer behavior.Market Segmentation - Need and Basis of Segmentation - Marketing Strategy- Segmentation - Targeting - Positioning.

UNIT - III

Sales Forecasting - Various methods of Sales Forecasting - Analysis and Application. Product - Characteristics - Benefits - Classification - New Product development process - Product life cycle - Product Portfolio analysis - Product line and Product mix decision.

UNIT - IV

Pricing - factors influencing pricing decisions- pricing objectives - pricing policies and procedures - pricing strategies - physical distribution - importance of various kinds marketing channels- Distribution problems.

UNIT - V

Promotion - Advertising - Publicity - Public relations - Personal Selling - Sales promotion administration.

REFERENCE BOOK:

1. Marketing - Rajan Nair -Sulthan Chand &Co.
2. Marketing -J.Jaya Shankar - MargamPublication
3. Marketting Management - Saxena -McGrawHils
4. Modern Marketting-R.S.N.Pillai and Bagvathi -S.Chand.

SKILL BASED SUBJECT
PAPER - 3
ENTREPRENEURIAL DEVELOPMENT

OBJECTIVE:

To gain knowledge about setting - up and managing a business

UNIT - I

Meaning of Entrepreneur - Entrepreneur and Enterprise - Entrepreneur and manager - Entrepreneur and Entrepreneur - Qualities (Traits) of a True Entrepreneur Characteristics of Entrepreneur - Types of Entrepreneurs - Functions of an Entrepreneur - Roles of Entrepreneurs in the Economic Development.

UNIT - II

Establishing an Enterprise - Project Identification - Selection of the Product - Project Formulation - A Assessment of Project Feasibility - Preparation of Project Report - Selection of Site(Location)

UNIT - III

Selection of Types of Organization - Sole Proprietorship - Partnership joint stock Company - Factors Influencing the Choice of Organization - Sources of Project Finance - Sources of Long Term Finance - Sources of Short Term Finance.

UNIT - IV

Incentives and Subsidies - Meaning of Incentives and Subsidies - Need and Problems Incentives for Development of Backward Area - Incentives for SSI Units in BackwardAreas - Incentives for SSI Units - Subsidies and Incentives in TamilNadu.

UNIT - V

Women Entrepreneurs - Concept - Functions and Role - Problems of Women Entrepreneurs - Suggestions for Development of Women Entrepreneurs - Rural Entrepreneurship - Need - Problems - How to Develop Rural Entrepreneurship.

REFERENCE BOOKS:

1. C.B.Gupta- Entrepreneurship Development in India - SultanChand
2. Jayashree Suresh - Entrepreneurial Development -MarghamPublications
3. P. saravanavel- Entrepreneurial development - Ess pee kay pub.House
4. Dr.S.S.Khanka- Entrepreneurial Development -S.Chand.

SEMESTER VI
PAPER - 8
COMPUTER GRAPHICS AND WEB DESIGNING

UNIT - I

Overview of Computer Graphics System: Overview of Computer Graphics system - Video display devices - Raster Scan and random scan system - Primitives and Attributes: Drawing a line, circle and ellipse generating algorithms - Scan line algorithm - Character generation - attributes of lines, curves and characters

UNIT - II

TWO Dimensional Viewing and Geometric Transformation: Principles of viewing - windowing - clipping - co-ordinate reference frame - basic transformation - scaling and rotations.

UNIT - III

THREE Dimensional Objects: Object display methods - Depth Presentation - stereoscopic views - surface models - cubic's- spines and curves - 3D viewing - Elimination and surface rendering - Color and animation.

UNIT - IV

HTML - Forms - Tables - Web page design - Java Script Introduction - Control Structures - Functions - Arrays - objects - simple web application.

UNIT - V

Dynamic HTML - Introduction -Cascading style sheets - Servlets - Deployment of simple servlets - Web Server(Java web server/Tomcat/web logic) - HTTP GET and POST Requests - Session - Cookies- JDBC connectivity.

TEXT BOOKS:

1. Asthana, R.G.S. and Sinha, N.K.,(1996),”Computer Graphics” New Age Int.Pub.(p)Ltd.,publishers.
2. Hearn, D. and Pauline Baker, M. (1987),”Computer Graphics(C-Version)” 2nd Edition, Pearson Education,Delhi.
3. Jennifer Niederst(1999) Web Design in a Nutshell, Shroff Publishers Pvt. Ltd, Mumbai

PAPER- 9

SOFTWARE ENGINEERING

UNIT - I

Introduction to Software Engineering: Definition - size factor- Quality and Productivity Factors - managerial Issues. Planning a software Project: Defining the Problem - Goals and Requirements - solution strategy. Planning the development Process: Various Models - Planning an Organizational Structure - Planning Activities.

UNIT - II

Software cost estimation: Introduction - Software cost Factors - Software cost Estimation - Estimating Software maintenance Costs. Software Requirement: Definition - Software Requirement specification - Specification Techniques.

UNIT - III

Software Design: Design concept - Modules and Modularization Criteria - Design Notation - Design Considerations - Test Plans - Milestones, Walkthroughs and Inspections. Design Guidelines Implementation Issues: Structure Loading Techniques - Coding Style.

UNIT - IV

Modern Programming Languages Features: Type Checking - User defined Data Types - Scoping Rules - Exception Handling. Verification and Validation Techniques: Quality Assurance - States Analysis.

UNIT - V

Unit Testing and Debugging - System Testing - Formal verification. Software Maintenance - Maintainability. Configuration Management - Source Code Metrics - Other maintenance Tools and Techniques.

TEXT BOOK:

1. RICHARD FAIRLEY, Software Engineering Concepts. TATA Mc GRAW-Hill Edition.
2. A.Zakiuddin Ahmed, Software Engineering, Margham Publications, Chennai.

REFERENCE BOOK:

Software Engineering VI Edition,
Author: ROGER S.PRESSMAN
Publishers : TATA McGRAW HILL International Edition.

PAPER - 10

MULTIMEDIA

UNIT - I

Definition - classification - Applications of Multimedia - Multimedia Hardware - Multimedia Software - CDROM- DVD

UNIT - II

MM Audio: Digital Audio Technology - sound cards - recording and editing - MIDI Fundamentals - Working with MIDI - audio file formats.

UNIT - III

MM Text: Text in Multimedia. MM Graphics: Coloring- digital imaging fundamentals- developing and editing - fileformats.

UNIT - IV

MM Animation: Computer animation fundamentals- kinematics- morphing - animation software tools and techniques. MM Video: Digital Video fundamentals - digital video production and editing techniques - file formats

UNIT - V

MM Project: Various stages of MM project design and development - MM Skills - MM team - MM authoring.

TEXT BOOK:

1. Multimedia Magic -S.Gokul revised and updated second edition - BPB

REFERENCE BOOK:

1. Multimedia Making it work - Tay Vaughen 6th edition - TMH.

CORE PRACTICAL - IV
COMPUTER GRAPHICS & WEB DESIGNING LAB

Computer Graphics:

1. Bresenham's algorithm for drawing line, circle and ellipse.
2. Graphic primitives (Line, Circle, Box etc.)
3. 2D transformation (scaling, translation, rotation, reflection and shearing).
4. Clipping and windowing.
5. 3D transformations (scaling, translation and rotation).

Web Designing:

1. Create a simple page introducing yourself how old you are, what you do, what you like and dislike. Modify the introduction to include a bullet list of what you do and put list the 5 things you like most and dislike as numbered lists. Create another page about your favorite hobby and link it to (and form) your main page. Center something, and put a quote on one of your pages.
2. Put an existing image on a web page. Create a table, use a heading and at least one use of row span/col. Span. Color a page and some text within the page. Link to another site.
3. Create a new file called index.html.
 - Put the normal HTML documents structure tags in the file. Give it a title.
 - At the bottom of the page (i.e. the last thing between the body tags) put the following:
 - A horizontal rule.
 - A Link to your e-mail Address (with your name between the tag); remember to put the link to your E-Mail address within address tags.
 - A line break.
 - The date. (I have this same structure at the bottom of this page).
 - Above this block (which is called the footer), put a title in headings tags.
 - Add some text describing yourself (you can split this into multiple headings and Paragraphs if you wish)
4. Write a script to create an array of IO elements and display its contents.
5. Write a function in java script that takes a string and looks at it character by character.

Text Books:

1. Asthana, R.G.S. and Sinha, N.K., (1996), "Computer Graphics" New Age Int. Pub.(p) Ltd., publishers.
2. Hearn, D. and Pauline Baker, M. (1987), "Computer Graphics (C-Version)" 2nd Edition, Pearson Education, Delhi.
3. Jennifer Niederst (1999) Web Design in a Nutshell, Shroff Publishers Pvt.Ltd, Mumbai

CORE PRACTICAL - IV

MULTIMEDIA LAB

1. PhotoEffects:

Decolouring, Changing cloth texture and pattern, Changing background, Applying soft light effect.

2. PhotoRetouching:

2.1 Colour correction, Blending Images, smooth skin effects, adding blur effects to background.

2.2 Converting black and white photo to colourphoto.

3. TextEffect:

Creating Metatic text, Shining text, Illumines text, Transparent glass text, Marquee, Digital banner.

4 .Image Editing :

Creating simple Images. a. Editing - resize, change colour depth, resolution, file format, brightness, add and edit layer style, add text. b. Stitch and edit two images into single using selection, Lasso and elone stamp tools (masking).

5 .WebGraphics:

a. creating a gif image using image ready for web b. Create a web navigation Image

6 .Animation:

Text: a. Text floating into screen from outside the screen. b. Animated Banner using image ready/any other software. c. Fade in fade out banners.

7. Animation:

Image: a. Animated lightening strike. b. Mobile wall paper c. icon animation

8. Create a digital clockAnimation.

REFERENCE BOOK:

1. Multimedia Making it work - Tay Vaughen 6th edition -TMH.

INTERNAL ELECTIVE

PAPER - 2

A. DATA ANALYTICS WITH R

UNIT - I

R BASICS

Introduction: What is R-Downloading and Installing R-. Getting Data into R: First Step in R: Typing in Small Datasets - Concatenating Data with c Function - Combining Variables with the c, cbind, rbind Functions - Vector Function - Matrix - Data frame - List - Importing Excel Data - Accessing Data from other Statistical Packages - Accessing the Database. Functions - The Attach Function - Exporting Data - The Tapply Function - The Sapply and Lapply Function - The Summary and Table Function. Importing Data - Csv, Excel, Table, Xml, Json, Databases Conditional - Control flow - Loops- A Function with Multiple Arguments

UNIT - II

EXPLORATORY DATA ANALYTICS

Cleaning Data: - Exploring raw data -Missing values - Zeros and NAs - Separating - Uniting Columns - String Manipulation - Filling Missing values - Packages - R Visualization Packages - Lattice - ggplot2 -Plotly, seaborn

UNIT - III

VISUALIZATION PACKAGES

Understanding plots - aesthetics - statistical function - Histogram - Box Plot - Density Plot - Scatter Plots The Plot Function -Adding a Smoothing Line The Pie Chart - The Bar and Strip Chart - Box Plot - Cleveland Dotplots- Reporting- Data Preparation - Embedding R chunks - Labelling and reusing code chunks - Report Compiling - Configuring - R Packages - shiny -Flex - ggvis

UNIT - IV

VISUALIZATION: UNIVARIATE AND MULTIVARIATE ANALYSIS

Variable Analysis - One variable - Understanding outliers through - histogram, boxplot, density plot - dataset - pseudo dataset of facebook Exploring two variables - Understanding Variables and relationships - scatter plots - correlations - condition means - Explore multivariate variables - Visualization of variables using aesthetics in R - Case study - Explore Diamond dataset for prize prediction

UNIT - V

CATEGORICAL AND NUMERICAL DATA INSIGHTS & INFERENCE

Data types - Categorical - Binary - ordinal - Nominal - Continuous - Discrete - Data Dimensions - Univariate - bivariate - multivariate - Numerical Measures - Central Tendency - Mean - Median - Mode - Understanding data using central tendency - plotting histogram - density plots and inference of plot - Variability Measure - Variance - Range - IQC - and Standard Deviation - Sum of squares - Squared Deviations - Absolute Deviations - Identify outlier using Inter Quartile Range - Visualization using boxplot

TEXT BOOKS

1. V. Bhuvaneshwari, “Data Analytics with R - Step by Step”, SciTech Publications, 2016.
2. Roger D. Peng, “R Programming for Data Science” Lean Publishing, 2014
3. Alain F. Zuur, Elena N. Ieno, Erik H.W.G. Meesters, “A Beginner’s Guide to R” Springer, 2009
4. [Hadley Wickham](#), “R for Data Science: Import, Tidy, Transform, Visualize, and Model Data”, First Edition, O’Reilly Media Publisher, ISBN: 9781491910399, 2017

REFERENCE BOOKS

1. Kaelen Medeiros, “R Programming Fundamentals”, ISBN: 9781789612998, 2018, [Packt]
2. VitorBinanchiLanzetta, “Hands-On Data Science with R”, ISBN: 9781789139402, 2018, [Packt]
3. Omar Trejo Navarro, “R Programming by Example”, ISBN: 9781788292542, 2017, [Packt]
4. [Jared P. Lander](#), “R for Everyone: Advanced Analytics and Graphics”, Second Edition, Pearson Education Publisher, ISBN: 9789386873521, 2018

INTERNAL ELECTIVE

PAPER - 2

B. FUNDAMENTALS OF BIOLOGICAL SCIENCES

UNIT- I

Microbial world: Structure of bacteria, virus and algae, Environmental and industrial application of microbes. Food microbiology - food spoilage, food preservation and fermentation.

UNIT - II

Classification and morphology of plant: Outline of Classification of Major plant communities. General morphology of fungi, bryophytes, pteridophytes, gymnosperms and angiosperms and their adaptations.

UNIT - III

Animals kingdom: Classification of invertebrates and vertebrates. Characteristics and morphological adaptations of the invertebrates and vertebrates.

UNIT - IV

Study of cells using microscopes, structural organization of cells-nucleus, mitochondria, endoplasmic reticulum, golgi apparatus, lysosomes and peroxisomes etc. and their function. Cell division.

UNIT - V

Fundamental of genetics, mendelian inheritance, mutation. Theories of origin of life - organic evolution, speciation, Chromosomal manipulation.

TEXT BOOKS:

1. Dutta, A.C(1995) "Botany for degree students. Oxford University Press, Chennai.
2. Reha Mathur, (1994) "Animal Behaviour", Restrogi & Company, Merrut.
3. Ready, S.M.[2004]"Microbial Biotechnology". Panima Book Publishing Company, New Delhi.

REFERENCES

1. Ce Robertis, EDP and EMF De Roberties, [1996] "Cell and Molecular Biology". B.I.Waverly Pvt. Ltd., New Delhi.
2. Prescott et al.,[1999] "microbiology", MC Graw Hill, New Delhi
3. Stebbins, G.L.,[1979] "Process of organic evolution". Prentice Hall of India, New

Delhi.

WEB RESOURCES

1. <http://www.netsci.org>
2. <http://www.animalword.net.in>
3. <http://www.biodive.org>

INTERNAL ELECTIVE
PAPER - 2
C.OPERATINGSYSTEM

UNIT - I

Introduction: Definition of Operating system - Functions of operating system - History of Operating system - Types of Operating system - System calls and system programs.

UNIT - II

Process Management: Definition of Process - Process states - process state transition - Operations on Process - Process control block - Inter process Communication - Deadlocks.

UNIT - III

Memory management: Single and Multiple partitioned allocation - Paging - Segmentation - Virtual Memory Management - Demand paging and page replacement algorithms.

UNIT - IV

Information Management: File concept - Access methods - Directory structure - Allocation methods- free space management- disk scheduling.

UNIT - V

Unix Operating System: Structure of Unix Operating System - Shell and Kernel of Unix O/S -Files system - simple commands: ls, cp, rm, who, mkdir, cd, rmdir, more, lp, wall, mail etc.

TEXT BOOK

Abraham Silberschatz and P.B. Galvin - Operating System Concepts - Addison Wesley Publication.

INTERNAL ELECTIVE
PAPER – 3
A. HUMAN RESOURCE MANAGEMENT

UNIT - I

Nature and scope of HRM - personnel Management and HRM - Functions of HRM - Functions of HR Manager - HRM as a profession - Indian perspective.

UNIT - II

Human Resource Planning - Recruitment - Selection - Methods of Selection - Use of Various tests - Interview techniques in selection -Placement.

UNIT - III

Induction - Training methods - Techniques - Identification of training needs - Training and Development.

UNIT - IV

Job satisfaction - Motivation (Maslow's and Two Factor Theory only) - Performance Appraisal - Methods - Compensation - Incentives - Monetary and Non-Monetary.

UNIT - V

Transfer - Promotion and Termination of Services - Career Development - Monitoring.

REFERENCE BOOKS:

1. Aswathappa- Human Resource and PersonnelManagement.
2. Memoria CB - PersonnelManagement.
3. Decenzo / Robbins - Human ResourceManagement.
4. Jayasankar - Human ResourceManagement.
5. C.B. Gupta - Human ResourceManagement.
6. L.M. Prasaad - Human Resource Management.

INTERNAL ELECTIVE
PAPER – 3
B. INFORMATION SECURITY

UNIT - I

INTRODUCTION: History, What is Security, CNSS Security Model, Components of an Information System, Balancing Information Security and Access, The Systems Development Life Cycle, The Security Systems Development Life Cycle. Communities of interest-Need for security: Threats, Attacks

UNIT - II

LEGAL, ETHICAL AND PROFESSIONAL ISSUES: Law and Ethics in Information Security, International Laws and Legal Bodies, Ethics and Information Security, Codes of Ethics and Professional Organizations Risk Management: An Overview of Risk Management, Risk Identification, Risk Assessment, Risk Control Strategies, Selecting a Risk Control Strategy

UNIT - III

PLANNING FOR SECURITY: Information Security Policy, Standards and Practices, The Information Security Blueprint, Security Education, Training and Awareness Program, Continuity Strategies

UNIT - IV

SECURITY TECHNOLOGY: Firewalls and VPNs- Intrusion Detection and Prevention Systems, Honeypots, Honeynets and padded cell systems -Scanning and Analysis Tools- Bio metric access control.

UNIT - V

CRYPTOGRAPHY: Cipher Methods, Cryptographic Algorithms, Cryptographic Tools, Protocols for secured communication-Attacks on Cryptosystems.

TEXT BOOK:

William Stallings, “Cryptography and Network Security”, Pearson Education, 2000

REFERENCE BOOK(S):

1. Michael E Whitman and Herbert J Mattord, “Principles of Information Security”, 4th Edition, Course Technology, Cengage Learning.
2. Micki Krause, Harold F. Tipton, “Handbook of Information Security Management”, Vol. 1-3 CRC Press LLC, 2008.
3. Stuart McClure, Joel Scrambray, George Kurtz, “Hacking Exposed”, Tata McGrawHill, 2003
4. Nina Godbole, “Information Systems Security”, Wiley-2009.

SKILL BASED SUBJECT

PAPER - 4

BUSINESS ETHICS

UNIT - I

Role and importance of Business Ethics and Values in Business - Definition of Business Ethics Impact on Business Policy and Business Strategy - Role of CEO - Impact on the Business Culture.

UNIT - II

Types of Ethical issues - Bribes - Coercion - Deception - Theft - Unfair Discrimination.

UNIT - III

Ethics internal - Hiring - Employees - Promotions - Discipline - Wages - Job Description - Exploitation of employees - Ethics External - Consumers - Fair Prices - False Claim Advertisements.

UNIT - IV

Ethics External - Environment Protection - Natural - Physical - Society - Relationship of Values and Ethics - Indian Ethos - Impact on the performance.

UNIT - V

Vendors - Government - Social Audit.

Text Books:

1. Memoria & Menoria- Business Policy.
2. David J. Fritzsche - Business Ethics: A Global & Management Perspective - Tata McGraw-Hill.
3. Ramaswamy Namakumari- Strategic Planning - Corporate Strategy - MacMillan India Ltd.
4. Velasquez - Business Ethics - Prentice - Hall of India.
5. Dr.S.Shankaran- Business Ethics & Values.
