THIRUVALLUVAR UNIVERSITY

BACHELOR OF COMPUTER APPLICATIONS

DEGREE COURSE

CBCS PATTERN

(With effect from 2017-2018)

The Course of Study and the Scheme of Examinations

S.No.	Part	Study Components Course Title		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
SEMESTER I							**CIA**	**Uni. Exam**	**Total**
1	I	Language	Paper-1	6	4	Tamil/Other Languages	25	75	100
2	II	English	Paper-1	6	4	English	25	75	100
3	III	Core Theory	Paper -1	6	6	Digital Logic & Programming in C	25	75	100
4	IIII	Core Practical	Practical-1	3	2	Programming in C Lab	25	75	100
5	III	ALLIED-1	Paper-1	7	4	Mathematical Foundations - I	25	75	100
6	IV	Environ. Studies		2	2	Environmental Science	25	75	100
				30	**22**		**150**	**450**	**600**
SEMESTER II							**CIA**	**Uni. Exam**	**Total**
7	I	Language	Paper-2	6	4	Tamil/Other Languages	25	75	100
8	II	English	Paper-2	4	4	English	25	75	100
9	III	Core Theory	Paper-2	6	6	C++ & Data Structure	25	75	100
10	III	Core Practical	Practical-2	3	2	C++ and Data Structures Lab	25	75	100
11	III	ALLIED-1	Paper-2	7	6	Mathematical Foundations - II	25	75	100
12	IV	Value Education		2	2	Value Education	25	75	100
13	IV	Soft Skill		2	1	Soft Skill	25	75	100
				30	**25**		**175**	**525**	**700**
SEMESTER III							**CIA**	**Uni. Exam**	**Total**
14	III	Core Theory	Paper-3	5	3	Java Programming	25	75	100
15	III	Core Theory	Paper-4	4	4	E-Commerce	25	75	100
16	III	Core	Paper-5	5	4	Resource Management	25	75	100

S.No.	Part	Study Components Course Title		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
		Theory				Techniques			
17	III	Core Practical	Practical-3	4	3	Java Programming Lab	25	75	100
18	III	ALLIED-2	Paper-3	7	4	Financial Accounting - I	25	75	100
19	IV	Skill based Subject	Paper-1	3	3	Design and Analysis of Algorithm	25	75	100
20	IV	Non-major elective	Paper-1	2	2	Introduction to Information Technology	25	75	100
				30	**23**		**175**	**525**	**700**
SEMESTER IV							**CIA**	**Uni. Exam**	**Total**
21	III	Core Theory	Paper-6	5	3	Database Management Systems	25	75	100
22	III	Core Theory	Paper-7	4	4	Enterprise Resource Planning	25	75	100
23	III	Core Theory	Paper-8	5	4	Decision Support System	25	75	100
24	III	Core Practical	Practical-4	4	3	RDBMS Lab	25	75	100
25	III	ALLIED-2	Paper-4	7	6	Financial Accounting - II	25	75	100
26	IV	Skill based Subject	Paper-2	3	3	Computer Organisation and Architecture	25	75	100
27	IV	Non-major elective	Paper-2	2	2	Internet and its applications	25	75	100
				30	**25**		**175**	**525**	**700**
SEMESTER V							**CIA**	**Uni. Exam**	**Total**
28	III	Core Theory	Paper-9	6	3	Mobile Application Development	25	75	100
29	III	Core Theory	Paper-10	6	3	Operating System	25	75	100
30	III	Core Theory	Paper – 11	4	2	Data Communication & Network	25	75	100
31	III	Core Practical	Practical-5	4	3	Mobile Applications Development - Lab	25	75	100
32	III	Core Practical	Practical-6	4	3	Operating System - Lab	25	75	100
33	III	Elective I	Paper-1	3	3	A. Data Mining	25	75	100

S.No.	Part	Study Components Course Title		Ins. hrs /week	Credit	Title of the Paper	Maximum Marks		
						B. Computer Graphics C. Information Security			
34	IV	Skill Based Subject III	Paper-3	3	3	Software Engineering	25	75	100
				30	**20**		**175**	**525**	**700**
SEMESTER VI							**CIA**	**Uni. Exam**	**Total**
35	III	Core Theory	Paper-12	7	5	Cloud Computing	25	75	100
36	III	Core Theory	Paper-13	6	4	Open Source Programming	25	75	100
37	III	Core Practical	Practical-7	4	3	ASP .NET Lab	25	75	100
38	III	Core Practical	Practical-8	4	3	Open Source Programming - Lab	25	75	100
39	III	Elective II	Paper-2	3	3	A. Software Testing B. Mobile Computing C. Microprocessor	25	75	100
40	III	Elective III	Paper-3	3	3	A. Internet of Things B. System Software C. Multimedia Systems	25	75	100
41	IV	Skill Based Subject IV	Paper-4	3	3	ASP .NET	25	75	100
42	V	Extension Activities		0	1		100	0	100
				30	**25**		**275**	**525**	**800**

Part	Subject	Papers	Credit	Total credits	Marks	Total Marks
Part I	Languages	2	4	8	100	200
Part II	English	2	4	8	100	200
Part III	Allied (Odd Semester)	2	4	8	100+100 (I + III SEM)	200
	Allied (Even Semester)	2	6+6	12	100+100 (II + IV SEM)	200
	Electives	3	3	9	100	300
	Core	13	(3-6)	51	100	1300
	Core Practical	8	(2-3)	22	100	800
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	4	3	12	100	400
Part V	Extension	1	1	1	100	100
	Total	**42**		**140**		**4200**

THIRUVALLUVAR UNIVERSITY

BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS
UNDER CBCS

(with effect from 2017 - 2018)

SEMESTER I

PAPER – 1
Digital Logic &Programming in C

Objective :

Provide basic knowledge on Digital Electronics to understand the working principles of Digital computer and to develop programming skill using C language .

UNIT I: Number systems and Boolean Algebra

Number Systems -Decimal, Binary, Octal, Hexadecimal and their inter conversions, - Binary Arithmetic -1's complement, 2's complement and 9's complement .Binary codes - BCD, Excess-3, Graycode.

Boolean Algebra : Boolean Laws - Simplification of Boolean Functions - Logic gates and Truth Table – Universal Gates (NAND and NOR) - The K-map method up to five variables, don't care conditions, POS & SOP forms.

UNIT-II: Combinational and Sequential Circuits

Combinational Logic: Half/Full adder/subtractor , code conversion, Multiplexers,demultiplexers, encoders, decoders, Combinational design using MUX & DEMUX. BCD adder, magnitude comparator.**Sequential logic**: Flip flops (RS, Clocked RS, D, JK, JK Master Slave)-Counters & types Synchronous and Asynchronous counters- Registers, Shift registers and their types.

UNIT –III: C Basics and Control constructs

C fundamentals- Operators- Constants- Expression – Library functions- Decision making and branching- Switch- FOR,WHILE, DO WHILE loops- Continue- break

Unit IV: Arrays, Functions and Structures

Arrays-Multi dimensional arrays- User defines functions- Call by Value and reference- Recursion- Storage classes- Structures and Union –Self referential structures

Unit – V: Pointers and Files

Pointers- Pointer operations and Arithmetic- File management in C :File opening and closing- - I/O operations on files - Error handling during I/O operations - Random access to files - Command line arguments

Text Book:

1. Morris Mono M. "**Digital Logic and Computer Design**",PHI Latest Pub. Ed. (Unit I and 2)
2. ReemaThareja,**" Programming in C "** Oxford University Press

Reference Book

1. Albert Paul Malvino, Donald P Leach, **Digital principles and applications**TMH,1996.
2. Balagurusamy," Programming in C" TMH

CORE PRACTICAL – I

PROGRAMMING IN C- LAB

1. Summation of Series: Sin(x) (Compare with built in functions)
2. Summation of Series Cos(x) (Compare with built in functions)
3. Counting the no. of vowels, consonants, words, white spaces in a line of text
4. Reverse a string & check for palindrome without built in string function
5. ${}^{n}P_{r}$, ${}^{n}C_{r}$ in a single program using function
6. Matrix Addison, subtraction and multiplication
7. Linear Search of a number in an array
8. Sorting an array in ascending and descending order
9. Finding maximum and minimum of list of numbers
10. Call by value and call by reference of functions
11. Employee pay bill using structure
12. Preparing an EB bill using file

ALLIED

PAPER - I

MATHEMATICAL FOUNDATIONS - I

Objectives

To know about Logical operators, validity of arguments, set theory and set operations, relations and functions, Binary operations, Binary algebra, Permutations & Combinations, Differentiation, Straight lines, pair of straight lines, Circles, Parabola, Ellipse, Hyperbola.

UNIT-I: SYMBOLIC LOGIC

Proposition, Logical operators, conjunction, disjunction, negation, conditional and bi-conditional operators, converse, Inverse, Contra Positive, logically equivalent, tautology and contradiction. Arguments and validity of arguments.

UNIT-II: SET THEORY

Sets, set operations, venndiagram, Properties of sets, number of elements in a set, Cartesian product, relations & functions,

Relations : Equivalence relation. Equivalence class, Partially and Totally Ordered sets,

Functions: Types of Functions, Composition of Functions.

UNIT-III: BINARY OPERATIONS

Types of Binary Operations: Commutative, Associative, Distributive and identity, Boolean algebra: simple properties. Permutations and Combinations.

UNIT-IV: DIFFERENTIATION

Simple problems using standard limits,

$$\lim_{x \to a} \frac{x^n - a^n}{x - a}, \lim_{x \to 0} \frac{\sin x}{x}, \lim_{x \to 0} \frac{\tan x}{x}, \lim_{x \to 0} \frac{e^x - 1}{x}, \lim_{n \to \infty} (1 + 1/n)^n, \lim_{n \to 0} (1+n)^{1/n}$$

Differentiation, successive differentiation, Leibnitz theorem, partial differentiation, Applications of differentiation, Tangent and normal, angle between two curves.

UNIT-V: TWO DIMENSIONAL ANALYTICAL GEOMETRY

Straight Lines - Pair Straight Lines

Text Book.

P.R. Vittal, Mathematical Foundations – Maragham Publication,

Chennai.

Reference Books

1. U. Rizwan, Mathematical Foundation - SciTech, Chennai
2. V.Sundaram& Others, Dircrete Mathematical Foundation - A.P.Publication, sirkali.
3. P.Duraipandian& Others, Analytical Geometry 2 Dimension - Emerald publication 1992 Reprint.
4. Manicavachagompillay&Natarajan. Analytical Geometry part I - Two Dimension - S.Viswanathan (printers & publication) Put Ltd., 1991.

SEMESTER II

CORE THEORY PAPER – 2

C++ AND DATA STRUCTURE

Objective: To develop Object oriented programming skills using C++ and to introduce data structure concepts.

UNIT-I : Object Oriented Concepts and C++

C++ Fundamentals - Operators, Expressions and Control Structures: If, If..Else, Switch - Repetitive Statements- for, while, do..while - Input and Output in C++ - manipulators-manipulators with parameters. - Pointers and arrays

UNIT-II : Functions and Classes

Functions in C++ - Main Function - Function Prototyping - Parameters Passing in Functions - Values Return by Functions - inline Functions - Function Overloading.
Classes and Objects; Constructors and Destructors; and Operator Overloading - Type of Constructors

UNIT – III : Inheritance, Polymorphism & Files

Inheritance : Single Inheritance - Multilevel inheritance - Multiple inheritance - Hierarchical Inheritance - Hybrid Inheritance - Polymorphism - Working with Files : Classes for File Stream Operations - Opening and Closing a File - End-of-File Detection - Updating a File - Error Handling during File Operations .

UNIT-IV : Fundamental Data Structures

Definition of a Data structure - primitive and composite Data Types, Stacks (Array) - Operations –Linked Stack-Operations- Applications of Stack (Infix to Postfix Conversion).

Queue (Array)- operations-Linked Queue- Operations- - Singly Linked List - Operations, Application of List (Polynomial Addition)-. Doubly Linked List - Operations.

UNIT-V : Trees and Graphs

Trees: Binary Trees –Binary Search Tree- Operations - Recursive Tree Traversals- Recursion
Graph - Definition, Types of Graphs, Graph Traversal –Dijkstras shortest path- DFS and BFS.

Text Books

1. Mastering in C++, K.R.Venugopal, Raj Kumar, T.Ravisankar – McGraw Hill, 2011.
2. C++ Plus Data Structure by Nell Dale ,Narosa Publications, 2000

Reference Books:

1.ReemaThareja , Object Oriented Programming with C++, Oxford University Press, 2015

2. Balagurusamy, c++ programming, TMH.

3. Fundamentals of Data Structures in C++ by Ellis Horowitz, SartajSahni and Dinesh Mehtha, Second Edition, University Press

4. Data Structures using C++ byVarshaH.Patil. Oxford University Press, 2012

PRACTICAL – II

C++ & DATA STRUCTURE - LAB

1. Implementing classes, object, constructors and member functions for calculating area and perimeter of a circle.
2. Implementing function overloading(Find area/volume of rectangle, circle, sphere, cylinder, cone etc).
3. Implementing operator over loading(Addition, subtraction, multiplication of matrices)
4. Implementing single , multiple , hierarchical inheritance.
5. Implementing sequential file operations using error handling functions.
6. Implementing PUSH, POP operations of stack using Arrays.
7. Implementing add, delete operations of a queue using Arrays.
8. Implementing Infix to postfix conversion of an expression using stack
9. Implementing Binary tree recursive traversals (in-order, pre-order, and post-order).
10. Implementing Polynomial addition using linked list.

ALLIED II

MATHEMATICAL FOUNDATIONS II

Objectives

To know about Matrix Operations, Symmetric, Skew-Symmetric, Hermitian, Skew-Hermitian, Orthogonal, Unitary Matrices. Rank of a Matrix Solutions of linear equations Consistency and Inconsistency, Characteristic roots and Characteristics Vectors, Cayley - Hamilton Theorem, Integration of rational functions, Integration by parts, Reduction formulae, Area and volume using integration, Planes, Straight lines, Spheres, Curves, Cylinders.

UNIT-I: MATRICES

Multiplication of matrices, Singular and Non-Singular matrices, Adjoint of a Matrix, Inverse of a matrix Symmetric and Skew-Symmetric, Hermitian and Skew-Hermition, Orthogonal and unitary matrices, Rank of a matrix, Solution of Simultaneous Linear equations by

(i) Cramer's rule.

(ii) Matrix Inversion Method.

UNIT-II: MATRICES

Test for Consistency and Inconsistency of linear equations, (Rank Method), characteristic roots and characteristic vectors, Cayley - Hamilton theorem, matrix of linear transformations: reflection about the x, y axes and the line y=x, rotation about the origin through an angle, expansion or compression, shears, translation.

UNIT-III

Integration Simple problems, integration of rational function involving algebraic expressions of the form

$$\frac{1}{\sqrt{ax^2+bx+c}}, \frac{1}{\sqrt{ax^2+bx+c}\sqrt{ax^2+bx+c}}, \frac{px+q}{\sqrt{ax^2+bx+c}}, \frac{px+q}{\sqrt{ax^2+bx+c}}, \sqrt{px+q}$$

integrations using simple substitutions integrations involving trigonometric functions of the form

$$\frac{1}{a+b\cos x}, \frac{1}{a^2\sin^2 x+b^2\cos^2 x}$$

Integration by parts.

UNIT-IV

Properties of definite integrals. Reduction formulae for

$\int x^n e^{ax} dx$, $\int \sin^n x dx$, $\int \cos^n x dx$, $\int x^m (1-x)^n dx$, applications of integration for (i) Area under plane caurves, (ii) Volume of solid of revolution.

UNIT-V: ANALYTICAL GEOMETRY OF THREE DIMENSION

Planes, straight lines.

Text Book.

P.R.Vittal, Mathematical Foundations - Margham Publication, Chennai.

Reference Books

1. U. Rizwan, Mathematical Foundation - SciTech, Chennai
2. V.Sundaram& Others, Dircrete Mathematical Foundation - A.P.Publication, sirkali.
3. P.Duraipandian& Others, Analytical Geometry 3 Dimension – Emerald publication 1992 Reprint.
4. Manicavachagompillay&Natarajan. Analytical Geometry part II - three Dimension - S.Viswanathan (printers & publication) Put Ltd., 1991.

SEMESTER III

CORE THEORY PAPER – 3

JAVA Programming

Objectives:
To improve Object Oriented Programming gathered already through an independent platform.

Unit – I: BASICS, ESSENTIALS, CONTROL STATEMENT AND CLASSES & OBJECTS

Computer and its Languages – Stage, Origin and Features for Java - JDK–OOP; Java Essentials:Program – API - Variables& Literals - Data Types - String Class – Operators - Type conversion - Constants - Scope – Comments - Keyboard Input; Control Statements: Conditional Statements – Looping Statements - Break and Continue Statements; Classes and Objects: Modifiers - Arguments - Constructors - Packages and import - Static Class - Overloaded Methods and Constructors - Returning Objects – toString() - this reference – Enumeration - Garbage Collection.

Unit – II: ARRAYS, INHERITANCE, INTERFACES AND PACKAGES

Arrays - Three or More Dimensions; Inheritance: Basics - Calling the Superclass Constructor - Overriding Superclass Methods - Inheritance from Subclasses – Polymorphism -Abstract Classes and Methods - Interfaces: Fields - Multiple inheritance - Interface inheritance; Packages: Creating packages – Accessing package from other packages- Access Specifier.

Unit – III: STRING HANDLING, EXCEPTION HANDLING AND MULTITHREADING

String Handling: Basics - Operations –String Methods - String Buffer class - String Builder – to String method -String Tokenizer class. Exception Basics: try and catch block - Multiple catch block - Nested try - throws keyword - Throw vs Throws - Final vs Finally vs Finalize - Method Overriding - Custom Exception - Multithreading: Life Cycle - Methods in Thread - thread application – Thread priority – Synchronization - Inter-thread communication - Suspending, Resuming, and Stopping Threads;

Unit – IV: APPLET AND GUI APPLICATION

Applets: Basis - Lifecycle - Applet classes - Application – Graphics; AWT-I: GUI Programming - AWT classes - Windows fundamentals- Creating Windows - Dialog Boxes - Layout Managers - Radio Buttons and Check Boxes – Borders-Swing

Unit – V: JAVA DATABASE CONNECTIVITY

JDBC - Types of Drivers- Architecture- Classes and Interfaces - Developing JDBC Application - New Database and Table with JDBC - Working with Database Metadata.

Text Book

1. S.Sagayaraj, R.Denis, P.Karthik & D.Gajalakshmi, "Java Programming", Universities Press, 2017

References

1. Patrick Naughton and Herbert Schildt. "The Complete Reference JAVA 2". 3rd Edition. Tata McGraw-Hill Edition, 1999.
2. Muthu C. "Programming with JAVA". 2nd Edition. Vijay Nicole Imprints, 2011.
3. Ken Arnold Gosling and Davis Holmen. "The Java Programming Language". 3rd Edition. Addition Wesley Publication.

CORE THEORY PAPER – 4

E-Commerce

UNIT-I

Electronic Commerce Framework, Traditional vs. Electronic business applications, the anatomy of E-commerce applications.

UNIT-II

Network infrastructure for E-Commerce - components of the I-way - Global information distribution networks - public policy issues shaping the I-way.The internet as a network infrastructure.The Business of the internet commercialization.

UNIT-III

Network security and firewalls - client server network security - firewalls and network security - data and message security - encrypted documents and electronic mail.

UNIT-IV

Electronic Commerce and world wide web, consumer oriented E-commerce, Electronic payment systems, Electronic data interchange (EDI),EDI applications in business ,EDI and E-commerce EDI implementation.

UNIT-V

Intraorganizational Electronic Commerce supply chain management.
Electronic Commerce catalogs, Document Management and digital libraries.

Text Book

1. R. Kalakota and A. B. Whinston, Frontiers of Electronic Commerce, Addison Wesley, 1996.

Reference Books

1.R.Kalakota and A.B.Whinston,Readings in Electronic Commerce, Addison Wesley, 1997.
2. David Kosiur, Understanding Electronic Commerce, Microsoft Press, 1997.
3. E-Commerce and E-Business, P.Rizwan Ahmed, Margham Publications.

CORE THEORY PAPER – 5

RESOURCE MANAGEMENT TECHNIQUES

Objectives: To improve the skills of solving very common problems which we come across in various fields like transportation and industries with machines. To develop computational skill and logical thinking in formulating industry oriented problems as a mathematical problem and finding solutions.

UNIT – I: Introduction and Linear Programming

.

BASICS OF OPERATIONS RESEARCH: Development – Definition – Characteristics – Phases – Models – Advantages and Limitations **LINEAR PROGRAMMING :** Formulation – Graphical Method of Solution – General Linear Programming Problem – Canonical and Standard form of LPP – Simplex method.

UNIT – II: Transportation and Assignment Model

TRANSPORTATION MODEL : Definition – Formulation and Solution – Additional Problems **ASSIGNMENT MODEL :** Definition – Solution of Assignment Models – Hungarian Method – Additional Problems – Traveling Salesman problem.

UNIT – III : SEQUENCING MODLES

Sequencing Problems – Assumptions – Processing *n* jobs through two machines – Processing *n* jobs through three machines – Processing of two jobs through *m* machines.

UNIT – IV: REPLACEMENT MODELS

Introduction – Replacement of items that deteriorate – Replacement of items whose maintenance and repair cost increase with time – Replacement of items that fail suddenly – group replacement policy.

UNIT – V: NETWORKING ANALYSIS

Project – Project Planning – Project Scheduling – Project Controlling – Activity on Node diagram – Critical Path Method – Program Evaluation and Review Technique

TEXT BOOK

Operations Research, P. K. Gupta and D.S. Hira, , S. Chand & Co, 5th Edition,-2008.

REFERENCES:

1. Operations Research , S.D.Sharma-Kedarnath - Ramnath Delhi 16th Revised Edition, 2010.
2. Introduction to Operations Research, Hiller & Libermann , CBS Publishes, 1st Edition, 1994.

CORE PRACTICAL

Practical 3- JAVA Programming LAB

List of Practical's

1. Implementing Package, inheritances and interfaces
2. Implementing Flow, Border and Grid Layouts
3. Implementing Dialogs , Menu and Frame
4. Implementing User defined Exception Handling
5. Implementing Multithreading
6. Implementing I/O Stream File handling
7. Implementing a Calculator using Swing
8. CRUD operation Using JDBC
9. Client Server using TCP and UDP Socket
10. GUI application with JDBC

ALLIED - 2

FINANCIAL ACCOUNTING - I

Objective:

To gain knowledge of accounting in general and to understand the system of Financial Accounting.

Unit - I: Introduction

Meaning of accounting – objectives of accounting – advantages and limitations of accounting- Accounting concepts and conventions - Methods of accounting -Rules of debit and credit- Journal - Ledger accounts– Trial Balance - Errors and their rectification - Rectification of Errors without suspense a/c - Rectification errors with suspense a/c (effect of rectification on profit and rectification during subsequent accounting year are excluded) - Bank Reconciliation Statement.

Unit - II: Depreciation, Provisions and Reserve

Meaning of depreciation – causes for depreciation – need for charging depreciation – Methods of calculating depreciation: straight line method and written down value method (change in method of depreciation is excluded) – Methods of recording depreciation: by charging depreciation to assets account or by creating provision for depreciation account.

Unit - III: Bills of exchange

Meaning of bill of exchange - features and advantages of bill of exchange- types of bill of exchange: Trade bills and accommodation bills - Accounting treatment of trade bills (accommodation bills are excluded).

Unit - IV: Final accounts

Meaning of final accounts – adjustments in preparation of final accounts – preparation of trading, profit & loss account and balance sheet of sole proprietorship concern.

Unit V: Accounts from incomplete records

Meaning of single entry system – features and limitations of single entry system – Distinction between single entry system and double entry system - Methods of calculation of profit: Statement of affairs method and Conversion method **–** Distinction between statement of affairs and balance sheet.

Note: Questions in section A,B and C shall be in the proportion of 20: 80 between theory and problems

Text books

1. Jain &Narang,Financial Accounting, KalyaniPublishers, New Delhi.
2. T.S. Reddy & Dr. A.Murthy, Financial Accounting, MarghamPublications, Chennai.

Reference books

1. Gupta,R.L&Gupta,V.K,AdvancedAccounting,Sulthan Chand&Sons,NewDelhi.
2. Shukla&Grewal,AdvancedAccounting,S.Chand&Co.NewDelhi.
3. Parthasarathy,S.&Jaffarulla,A.FinancialAccounting,KalyaniPublishers, NewDelhi.
4. Murugadoss, Jaya, Charulatha and Baskar, Financial Accounting, Vijay Nicholes Imprint Pvt. Ltd., Chennai.

SKILL BASED SUBJECT – PAPER 1

DESIGN AND ANALYSIS OF ALGORITHMS

Objective: To build a solid foundation of the most important fundamental subject in computer science. Creative thinking is essential to algorithm design and mathematical acumen and programming skills.

UNIT -I: ALGORITHM AND ANALYSIS

What is an Algorithm? - Algorithm Specification- Performance Analysis- Randomized Algorithms.

UNIT - II: DIVIDE AND CONQUER

General Method - Binary Search - Finding the Maximum and Minimum-Merge Sort - Quick Sort - Selection Sort- Stassen's Matrix Multiplications.

UNIT - III: THE GREEDY METHOD

The General Method - Knapsack Problem – Tree Vertex Splitting - Job Sequencing with Deadlines- Minimum Cost Spanning Trees - Optimal Storage on Tapes - Optimal Merge Pattern - Single Source Shortest Paths.

UNIT - IV: DYNAMIC POGRAMMING

The General Method – Multistage Graphs - All pair shortest path - String Editing - 0/1 Knapsack – Reliability Design - The Traveling Salesperson Problem

UNIT - V: TRAVERSAL, SEARCHING & BACKTRACKING

Techniques for Binary Trees- Techniques for Graphs - The General Method - The 8-Queens Problem – Sum of Subsets- Graph Coloring- Hamiltonian Cycles

TEXT BOOK

Fundamentals of Computer Algorithms, Ellis Horowitz, SartajSahni, SanguthevarRajasekaran, GalgotiaPublications, 1998.

REFERENCE BOOKS:

1. Introduction to Algorithms ,Coremen T.H.,Leiserson C.E. and Rivest R.L., PHI 1998.

2. Introduction to the Design and Analysis of Algorithms, AnanyLevitin, Pearson Education, 2nd Edition.

NON MAJOR ELECTIVE – I

INTRODUCTION TO INFORMATION TECHNOLOGY

Objective:

To enable the student to be proficient with Information Technology with a better knowledge of Computer

UNIT – I

Introduction to Computers: Definition - Characteristics of a Computer - Classification of Computers -Basic Anatomy of the Computer - Applications / Uses of Computers in different fields

UNIT – II

Input and Output Devices: Input Devices - Output Devices - Data Representation - Programming Languages / Computer Languages - **Software**: System Software - Application Software

UNIT – III

Data Communication and Computer Networks: Data Communication - Computer Network - The Uses of a Network - Types of Networks - Network Topologies- Transmission Media: Guided Transmission Media - Wireless Transmission

UNIT – IV

Internet and its Applications : History of Internet - Uses of Internet - Advantages of Internet - ISP - Internet Services - IP Address - Web Browser - URL - DNS - Internet Explorer - Types of internet connections - E-mail - Search Engine.

UNIT – V

Operating System: Evolution of operating systems - Function of Operating System - Classification of Operating –System - Example of Operating System – DOS –Windows – UNIX - Linux

TEXT BOOKS:

1. Alexis Leon and Mathews Leon, "Fundamentals of Information Technology", Vikas Publishing House Pvt. Ltd.
2. Introduction to Information Technology, P.Rizwan Ahmed, Second Edition, Margham Publications, 2016
3. Introduction to Information Technology, PelinAksoy, Laura DeNardis, Cengage Learning India Private Limited.

SEMESTER IV

CORE THEORY PAPER – 6

DATABASE MANAGEMENT SYSTEM

Objective: To incorporate a strong knowledge on databases to students

UNIT - I Database Basics

Introduction: Flat File – Database System – Database – Actionable for DBA. The Entity – Relationship Model: Introduction – The Entity Relationship Model. Data Models: Introduction – Relational Approach – The Hierarchical Approach – The Network Approach.

UNIT – II Relational Algebra

Structure of Relational Databases – Fundamental Relational Algebra Operations –Additional Relational Algebra Opearations - Extended Relational Algebra Operations - Null Values - Modification of the Database - The Tuple Relational Calculus – The Domain Relational Calculus

UNIT – III Normalization

Normalization: Introduction - Normalization – Definition of Functional Dependence (FD) – Normal Forms: 1NF, 2NF, 3NF and BCNF.

UNIT – IV Structured Query Language

Structured Query Language: Features of SQL – Select SQL Operations – Grouping the Output of the Query – Querying from Multiple Tables – Retrieval Using Set operators – Nested Queries. T-SQL – Triggers and Dynamic Execution: Transact-SQL..

UNIT – V Procedural Language

Procedural Language- SQL: PL/SQL Block Structure – PL/SQL Tables. Cursor Management and Advanced PL/SQL: Opening and Closing a Cursor – Processing Explicit Cursor – Implicit Cursor – Exception Handlers – Sub Programs in PL/SQL – Functions – Precaution While Using PL/SQL Functions – Stored Procedure – Object Oriented Technology.

Text Book

1. Rajesh Narang, "Database Management Systems", PHI Learning Private Limited, New Delhi, sixth printing, 2010.

Reference

1. S.K. Singh, "Database Systems – Concepts, Design and Appplications", Dorling Kindersley (India) Pvt. Ltd., Second Impression, 2008

2. Database System Concepts , Abraham Silberchatz, Henry F Korth , S.Sudarshan, McGraw-Hill - 5th Edition - 2006.

CORE THEORY PAPER – 7

ENTERPRISE RESOURCE PLANNING

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 process modeling.

Text Book:

1) ELLEN MONK and BRET WAGNER, ENTERPRISE RESOURCE PLANNING - 3rd edition - MGH.

CORE THEORY PAPER – 8

DECISION SUPPORT SYSTEM

UNIT I

DECISION-MAKING AND COMPUTERIZED SUPPORT-Management Support Systems: An Overview, Decision Making, Systems, Modeling, and Support.

UNIT II

DECISION SUPPORT SYSTEMS-An Overview, Data Management: Warehousing, Access, and Visualization , Modeling and Analysis , Knowledge based Decision Support and Artificial Intelligence , User Interface and Decision Visualization Applications , Constructing a Decision Support System and DSS Research.

UNIT III

COLLABORATION, COMMUNICATION, AND ENTERPRISE SUPPORT SYSTEMS-Networked Decision Support: The Internet, Intranets, and Collaborative Technologies, Group Decision Support Systems, Executive Information and Support Systems.

UNIT IV

FUNDAMENTALS OF EXPERT SYSTEMS AND INTELLIGEN SYSTEMS-Fundamentals of Expert Systems, Knowledge Acquisition and Validation, Knowledge Representation, Inferences, Explanations, and Uncertainty, Building Expert Systems: Process and Tools.

UNIT V

CUTTING-EDGE DECISION SUPPORT TECHNOLOGIES-Neural Computing: The Basics, Neural Computing Applications, Genetic Algorithms, Fuzzy Logic, and Hybrid Intelligent Systems , Intelligent Agents and Creativity , Implementing and Integrating Management Support Systems , Organizational and Societal Impacts of Management Support Systems.

Text Book :

1. Efraim Turban, Jay E. Aronson, "Decision Support Systems and Intelligent Systems", Prentice Hall, New Delhi, 2004

Reference book:

1. George Marakas, "Decision Support Systems in the 21st Century", Prentice Hall, New Delhi, 2003
2. Robert J Thierauf, "User Oriented Decision Support Systems", Prentice Hall, New Delhi

PRACTICAL – IV

RDBMS Lab

1. Table creation and simple Queries
2. Queries using Aggregate Function and Set Operations
3. Table creation with various Joins
4. Nested Sub queries and correlated Sub queries
5. View creation and manipulation
6. PL/SQL program for cursor
7. PL/SQL program for packages
8. PL/SQL program for triggers and its type
9. PL/SQL program for procedures and functions

ALLIED – II

FINANCIAL ACCOUNTING - II

Objective:

To gain a knowledge of accounting in general and to understand the system of Financial Accounting.

Unit - I: Branch accounts

Meaning – objects of branch accounts – accounting in respect of dependent branches: debtors system; stock and debtors system; wholesale branch system and final accounts system - Independent branches – incorporation of branch trial balance in head office books.

Unit - II: Departmental Accounting

Meaning of departments and departmental accounting – Distinction between departments and branches- need for departmental accounting – advantages of departmental accounting - Apportionment of indirect expenses – Inter departmental transfers at cost and selling price - preparation of departmental trading, profit & loss account and balance sheet.

Unit - III: Hire purchase and Instalment purchase systems

Meaning and features of hire purchase system - calculation of interest – books of hire purchaser and books of hire vendor - default and repossession (Hire purchase trading account excluded)

Meaning of instalment system -distinction between hire purchase system and instalment system - calculation of interest – books of buyer and books of seller.

Unit - IV: Partnership accounts (fundamentals and reconstitution of partnership)

Meaning and features of partnership – Partnership deed - calculation of Interest on capital and interest on drawings – preparation of profit & loss appropriation account – preparation of capital accounts (fixed and fluctuating) – admission of a partner – retirement of a partner – death of a partner – treatment of goodwill as per AS 10.

Unit - V: Partnership Accounts (Dissolution of partnership firms)

Dissolution of a firm – insolvency of a partner (Garner Vs Murray rule) – Insolvency of all the partners – Piecemeal distribution: proportionate capital method and maximum loss method.

Note: Questions in section A, B and C shall be in the proportion of 20: 80 between theory and problems.

Text books

1. Jain &Narang ,Financial accounting, Kalyani publishers, New Delhi
2. T.S. Reddy & Dr. A.Murthy, Financial accounting, Margham publications, Chennai

Reference books

1. Gupta,R.L&Gupta,V.K,AdvancedAccounting,Sultan Chand&Sons,NewDelhi.
2. Shukla&Grewal,AdvancedAccounting,S.Chand&Co.NewDelhi.
3. Parthasarathy,S.&Jaffarulla,A.FinancialAccounting,KalyaniPublishers,NewDelhi.
4. Murugadoss, Jaya, Charulatha and Baskar, Financial Accounting, Vijay Nicholes Imprint Pvt. Ltd., Chennai.

SKILLED BASED SUBJECT - II

COMPUTER ORGANISATION AND ARCHITECTURE

Objective: To enable the student to have a better understanding of architecture of computer and prepare the student for higher level of programming

UNIT - I

Instruction Codes – Computer Registers – Computer Instructions – Timing and Control – Instruction Cycle – Memory Reference Instructions – Input-Output and Interrupts.

UNIT - II

Control Memory – Address Sequencing – Micro program Examples – Design of Control Unit.

UNIT - III

Introduction – General Register Organization – Instruction Formats – Addressing Modes.

UNIT – IV

Peripheral Devices – I/O interface – Asynchronous Data Transfer – Modes of Transfer - Direct Memory Access – Input Output Processor (Excluding IBM and Intel IOPs).

UNIT - V

Auxiliary Memory – Main Memory – Auxiliary Memory - Associative Memory – Cache Memory -Virtual Memory.

TEXT BOOK

1. Morris Mano M. Computer System Architecture. New Delhi **:**Prentice Hall of India Private Limited, 2011

REFERENCES

1. William Stallings . Computer Organization and Architecture. 8th edition. Pearson publication, 2010
2. Morris Mano. Digital Login and Computer Design. New Delhi :Prentice Hall of India Private Limited, 2001

NON MAJOR ELECTIVE II

INTERNET AND ITS APPLICATION

Objective: To equip students to basics of Internet usage and prepare them for digital

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 explorer6 Searching the Internet- online help and tutorials- File Transmission Protocol (FTP) Browser settings.

UNIT – III

Attaching a file, Electronic mail Creating an E-mail id Sending and Receiving mails-attaching a file-Instance messaging- other web browsers.

UNIT - IV

Introduction to HTML headers - Linking- Images-special characters and line breaks- unordered lists- simple HTML programs.

UNIT - V

E-marketing consumer tracking Electronic advertising search engine-CRM- credit card Payments- Digital cash – e wallets – smart card.

Textbook

Internet and World Wide Web Third edition H.M.Deital, P.J. Deital and A.B.Goldberg-PHI

Book for Reference

1. The Internet- Complete Reference Harley hahn, Tata McGraw hill
2. Internet and its Applications, P.Rizwan Ahmed, Margham Publication, 2014

SEMESTER V

CORE THEORY PAPER – 9

MOBILE APPLICATIONS DEVELOPMENT

Objectives:

This course aims to provide the students with a detailed knowledge on Mobile Application and Development and covers Android programming from fundamentals to building mobile applications for smart gadgets.

UNIT I Introduction to Mobile Applications:

Native and web applications - Mobile operating systems and applications - Mobile Databases. Android: History of Android - Android Features – OSS – OHA - Android Versions and compatibility - Android devices - Prerequisites to learn Android -– Setting up software – IDE - XML. Android Architecture: Android Stack - Linux Kernel - Android Runtime - Dalvik VM - Application Framework - Android emulator - Android applications.

UNIT II Android development:

Java - Android Studio – Eclipse – Virtualization – APIs and Android tools – Debugging with DDMS – Android File system – Working with emulator and smart devices - A Basic Android Application - Deployment. Android Activities: The Activity Lifecycle – Lifecycle methods – Creating Activity. Intents – Intent Filters – Activity stack.

UNIT III Android Services:

Simple services – Binding and Querying the service – Executing services.- Broadcast Receivers: Creating and managing receivers – Receiver intents – ordered broadcasts. Content Providers: Creating and using content providers – Content resolver. Working with databases: SQLite – coding for SQLite using Android – Sample database applications – Data analysis.

UNIT IV Android User Interface:

Android Layouts – Attributes – Layout styles - Linear – Relative – Table – Grid – Frame. Menus: Option menu – context menu - pop-up menu – Lists and Notifications: creation and display. Input Controls: Buttons-Text Fields-Checkboxes-alert dialogs-Spinners-rating bar-progress bar.

UNIT V Publishing and Internationalizing mobile applications :

Live mobile application development: Game, Clock, Calendar, Convertor, Phone book. App Deployment and Testing: Doodlz app – Tip calculator app – Weather viewer app.

Text Books

1. Barry Burd, "Android Application Development – All-in-one for Dummies", 2nd Edition, Wiley India, 2016.

Reference

1. Paul Deitel, Harvey Deitel, Alexander Wald, " Android 6 for Programmers – An App-driven Approach", 3rd edition, Pearson education, 2016.
2. Jerome (J. F) DiMarzio, "Android – A Programmer"s Guide", McGraw Hill Education, 8th reprint, 2015.
3. http://www.developer.android.com

CORE THEORY PAPER - 10

OPERATING SYSTEM

Objective: Enable the student to get sufficient knowledge on various system resources.

Unit – I Operating System Basics

Basic Concepts of Operating System - Services of Operating System-Classification of Operating System- Architecture and Design of an Operating System-Process Management -Introduction to Process-Process State -PCB - Process Scheduling - Interprocess Communication

Unit –II Operating System Scheduling

CPU Scheduling**:** Introduction - Types of CPU Scheduler - Scheduling Criteria - Scheduling Algorithms - FCFS Scheduling – SJF Scheduling;-Priority Scheduling - Round-Robin Scheduling- Multilevel Queue Scheduling - Deadlock - Basic Concept of Deadlock- Deadlock Prevention - Deadlock Avoidance- Deadlock - Detection and Recovery

Unit- III Memory management

Memory Management - Basic Concept of Memory - Address Binding; Logical and Physical Address Space- Memory Partitioning - Memory Allocation-Protection-Fragmentation and Compaction

Unit – IV Swapping

Swapping- Using Bitmaps - Using Linked Lists- Paging-Mapping of Pages to Frames - Hierarchical Page Tables- Segmentation - Virtual Memory - Basic Concept of Virtual Memory-Demand Paging - Transaction Look aside Buffer (TLB) - Inverted Page Table-Page Replacement Algorithms

Unit –V File Management

File Management - Basic Concept of File-Directory Structure-File Protection-Allocation Methods – Various Disk Scheduling algorithms

Text Books:

Abraham Silberschatz Peter B. Galvin, G. Gagne, “Operating System Concepts”, Sixth Edition, Addison Wesley Publishing Co., 2003.

Reference

1. Operating systems - Internals and Design Principles, W. Stallings, 6th Edition, Pearson
2. Willam-Stalling “Operating System” Fourth Edition, Pearson Education, 2003.

CORE THEORY PAPER - 11
DATA COMMUNICATION & NETWORKS

Objective:

To equip students to basics of Data Communication and prepare them for better computer networking

UNIT I

Introductory Concepts - Network hardware - Network software – Network Architecture - Physical layer - Guided transmission media - Cable television.

UNIT II

Data Link Layer - Design issues - Channel allocation problem - Multiple access protocols - Ethernet - Wireless LAN - 802.11 architecture.

UNIT III

Network Layer : Design issues, Routing Algorithms, Shortest path routing, Flooding, Broadcast & Multicast routing congestion, Control & internetworking.

UNIT IV

Transport Layer - Transport service - Elements of transport protocols - User Datagram Protocol - Transmission Control Protocol.

UNIT V

Application Layer - DNS - Electronic mail - World Wide Web - Multimedia - Network security.

TEXT BOOK

1. Tannenbaum, A.S., 2003 : Computer Networks, Prentice Hall.

REFERENCES

1. Stallings, William, 2008 : Local and Metropolution Area Networks : An Introduction, Macmillian Publishing Co.
2. Black : Data Network, Prentice Hall of India.
3. W. Stallings, "Data and Computer Communication", Pearson Education, Fifth Edition, 2001

CORE PRACTICAL – 5

MOBILE APPLICATIONS DEVELOPMENT – LAB

1. Intent and Activity
2. Using Controls
3. Alert Dialogs
4. List View
5. Options Menu
6. Seek Bars
7. Shared Preferences
8. Status Bar Notifications
9. Tab Widgets Talking Clock.
10. Tween Animation
11. Grid View
12. Internal Storage - Files
13. SQlite - Database
14. Google Map
15. Permissions

CORE PRACTICAL – 6

OPERATING SYSTEM LAB

1. Implementing the Process system calls.
2. Implementing I/O system calls.
3. Implementing IPC using message queues.
4. Implementing CPU& scheduling algorithm for first come first serve scheduling.
5. Implementing CPU scheduling algorithm for shortest job first scheduling.
6. Implementing perform priority scheduling.
7. Implementing CPU scheduling for Round Robin Scheduling.
8. Implementing pipe processing.
9. Implementing first fit, best fit algorithm for memory management.
10. A program to simulate producer-consumer problem using semaphores.
11. A Shell Program to find factorial of a given number
12. A shell program to generate Fibonacci number

Elective – 1

A. DATA MINING

Objective: Enable the student to get sufficient knowledge on mining the data .

UNIT - I: Data Mining Basics

Introduction: Definition of data mining - data mining vs. query tools - machine learning - steps in data mining process - overview of data mining techniques.

UNIT - II: Data Models

Multidimensional Data Model - Data Cube - Dimension Modeling - OLAP Operations - Meta Data - Types of Meta Data.

UNIT - III: Data Editing

Data Pre-Processing And Characterization :Data Cleaning - Data Integration and Transformation - Data Reduction - Data Mining Query Language - Generalization - Summarization - Association Rule Mining

UNIT - IV: Classification

Classification: Classification - Decision Tree Induction - Bayesian Classification - Prediction - Back Propagation - Cluster Analysis - Hierarchical Method - Density Based Method - Grid Based Method - Outlier Analysis.

UNIT - V: Analysis

Cluster analysis: Types of data - Clustering Methods - Partitioning methods - Model based clustering methods - outlier analysis. Advanced topics: Web Mining - Web Content Mining - Structure and Usage Mining - Spatial Mining - Time Series and Sequence Mining.

TEXT BOOKS:

1. PaulrajPonnaiah, "Data Warehousing Fundamentals", Wiley Publishers, 2001.

2. Jiawei Han, MichelineKamber, "Data Mining: Concepts and Techniques",Morgan Kaufman Publishers, 2006.

REFERENCES:

1. UsamaM.Fayyad, Gregory Piatetsky Shapiro, Padhrai Smyth RamasamyUthurusamy, "Advances in Knowledge Discover and Data Mining", the M.I.T. Press, 2007.
2. Ralph Kimball, Margy Ross, The Data Warehouse Toolkit, John Wiley and Sons Inc., 2002
3. Alex Berson, Stephen Smith, Kurt Thearling, "Building Data Mining Applications for CRM", Tata McGraw Hill, 2000.
4. Margaret Dunham, "Data Mining: Introductory and Advanced Topics", Prentice Hall, 2002.
5. Daniel T. Larose John Wiley & Sons, Hoboken, "Discovering Knowledge in Data: An Introduction to Data Mining", New Jersey, 2004

B. COMPUTER GRAPHICS

Objectives: To equip students to basics of computer drawing and prepare them for computer modeling of objects

UNIT – I : OVERVIEW OF GRAPHICS SYSTEMS AND OUTPUT PRIMITIVES
Video Display Devices- Raster Scan System- Random Scan Systems- Hard Copy Deices- Graphic Software- Line Drawing Algorithms: DDA- Bresenham's Line -Circle Generating Algorithms

UNIT – II : ATTRIBUTES AND TWO DIMESIONAL TRANSFORMATIONS
Line Attributes- Curve Attributes-Color And Gray Scale Level- Area Fill Attributes- Character Attributes- Inquiry Functions- Basic Transformations - Composite Transformation – Other transformation

UNIT – III : TWO DIMENSIONAL VIEWING AND CLIPPING
The Viewing Pipeline- Window To Viewport Transformation –Clipping Operations- Point Clipping- Line Clipping: Cohen Sutherland- Liang Barsky-Sutherland Hodgeman Polygon Clipping- Text Clipping- Exterior Clipping- Logical Classification Of Input Devices- Interactive Picture Construction

UNIT – IV : THREE DIMENSION TRANSFORMATION, VIEWING AND CLIPPING
Translation-Rotation-Scaling-Viewing Pipeline- Viewing Coordinates- Projections -View Volumes and General Projection Transformation- Clipping -

UNIT – V : VISIBLE SURFACE DETECTION METHODS
Classification of Visible Surface Detection Algorithms - Back Face Detection - Depth Buffer Method - A Buffer Method - Scan Line Method - Depth Sorting Method- BSP Tree Method - Area Sub Division Method - Octree Methods - Ray Casting Method

TEXT BOOK:

Computer Graphics(C version), Donald Hearn and M.Pauline Baker, Pearson- 2nd Edit. 2012.

REFERENCE BOOKS:

1. Interactive Computer Graphics–A top down approach using Open GL, Edward Angel , Pearson, 5th Edition.

2. Computer Graphics, Peter Shirley, Steve Marschner, Cengage Learning, Indian Edition,2009.

C. INFORMATION SECURITY

Objective: To enable the student to understand various methodology available for securing information

UNIT I Information Security Basics

INTRODUCTION -History, What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

UNIT II Security Investigation

SECURITY INVESTIGATION - Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

UNIT III Security Analysis

SECURITY ANALYSIS-Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV Security Models

LOGICAL DESIGN-Blueprint for Security, Information Security Poicy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

UNIT V Security Physical Design

PHYSICAL DESIGN-Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel.

Text Book

1. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", Vikas Publishing House, New Delhi, 2003

Reference

1. Micki Krause, Harold F. Tipton, " Handbook of Information Security Management", Vol 1-3 CRC Press LLC, 2004.
2. Stuart McClure, Joel Scrambray, George Kurtz, "Hacking Exposed", Tata McGraw-Hill, 2003
3. Matt Bishop, " Computer Security Art and Science", Pearson/PHI, 2002.

SKILL BASED SUBJECT - 3

SOFTWARE ENGINEERING

Objective:
This course introduces the concepts and methods required for the construction of large software intensive systems.

UNIT-I:
Introduction - Evolving Role of Software - Changing Nature of Software – SoftwareMyths; A Generic View of Process: Layered Technology - Process Models: Waterfall Model - Evolutionary Process Models.

UNIT-II:
Requirements Engineering: Tasks - Initiating the Requirements Engineering Process - Eliciting Requirements - Building the Analysis Model - Requirements Analysis - Data Modeling Concepts.

UNIT-III:
Data Engineering: Design Process and Design Quality - Design Concepts - The Design Model Creating an Architectural Design: Software Architecture - Data Design -Architectural Design - Mapping Data Flow into Software Architecture; Performing User Interface Design: Golden Rules.

UNIT-IV:
Testing Strategies: Strategic Approach to Software Testing- Test Strategies for Conventional and Object Oriented Software - Validation Testing - System Testing -Art of Debugging. Testing Tactics: Fundamentals - White Box- Basis Path - Control Structure - Black Box Testing Methods

UNIT-V:
Project Management: Management Spectrum - People - Product - Process - Project. Estimation: Project Planning Process - Resources - Software Project Estimation - Project Scheduling - Quality Concepts - Software Quality Assurance - Formal Technical Reviews.

TEXT BOOK:
Roger S Pressman, "Software Engineering - A Practitioner's Approach", Sixth Edition, McGraw Hill International Edition, New York: 2005.

REFERENCES:

1. Ian Somerville, "Software Engineering", 7th Edition, Pearson Education, 2006.
2. Mall Rajib, " Software Engineering", 2/E, PHI, 2006.

SEMESTER VI

CORE THEORY PAPER – 12

CLOUD COMPUTING

Objective:

To enable the students to learn the basic functions, principles and concepts of cloud Systems.

UNIT I: UNDERSTANDING CLOUD COMPUTING

Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing – Cloud Services.

UNIT II: DEVELOPING CLOUD SERVICES

Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds.

UNIT III: CLOUD COMPUTING FOR EVERYONE

Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events.

UNIT IV: PROGRAMMING MODEL

Parallel and Distributed Programming Paradigms – Map Reduce, Twister and Iterative Map Reduce – Hadoop Library from Apache – Mapping Applications - Programming Support - Google App Engine, Amazon AWS - Cloud Software Environments -Eucalyptus, Open Nebula, Open Stack, Aneka, CloudSim.

UNIT V: SECURITY IN THE CLOUD

Security Overview - Cloud Security Challenges and Risks - Software-as-a-Service Security- Security Governance - Risk Management - Security Monitoring - Security Architecture Design - Data Security - Application Security - Virtual Machine Security - Identity Management and Access Control - Autonomic Security.

TEXT BOOK:

1. Michael Miller, “Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online”, Que Publishing, August 2008.

REFERENCES:

1. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.
2. John W.Rittinghouse and James F.Ransome, "Cloud Computing: Implementation, Management, and Security", CRC Press, 2010.
3. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach", TMH, 2009.
4. Kumar Saurabh, "Cloud Computing – insights into New-Era Infrastructure", Wiley India, 2011.
5. George Reese, "Cloud Application Architectures: Building Applications and Infrastructure in the Cloud" O'Reilly

CORE THEORY PAPER – 13

OPEN SOURCE PROGRAMMING

Objectives:
To discuss techniques that can be effectively applied in practice about HTML5, JavaScript, PHP , CSS and Linux

UNIT I : INTRODUCTION TO HTML5,JAVA SCRIPT, PHP AND CSS
Introduction to Dynamic Web content- HTTP and HTML- Request and Response Procedure- The Benefits of PHP, JAVA Script, CSS, and HTML5- Introduction to HTML5- The Canvas - The HTML5 Canvas- HTML5 Audio and Video- Introduction to CSS- CSS Rules-Style Types- CSS Selectors- CSS Colors.

UNIT-II : LINUX

Introduction : Linux Essential Commands – File system Concept – Standard Files – The Linux Security Model – Vi Editor – Partitions Creation – Shell Introduction – String Processing – Investigation and Managing Processes – Network Clients – Installing Application.

UNI- III : MYSQL

Introduction to MY SQL – The show Databases and Table – The USE command – Create Database and Tables – Describe Table – Select, Insert, Update, and Delete statement – Some Administrative detail – Table Joins – Loading and Dumping a Database.

UNIT-IV : PHP

PHP Introduction – General Syntactic Characteristics – PHP Scripting – Commenting your code – Primitives, Operations and Expressions – PHP Variables – Operations and Expressions Control -statement – Array – Functions.

UNIT – V PHP

Basic Form Processing – File and Folder Access – Cooking – Sessions – Database Access with PHP – MySQL - MySQL Functions – Inserting Records – Selecting Records – Deleting Records – Update Records.

Text Books

1. "Learning PHP, MySQL, Java Script, CSS and HTML5", Robin Nixon, O'Reilly Publications, 3rd Edition, 2014.
2. Steven Holzner, "HTML Black Book", Dreamtech Press &Paraglyph Press Publishers, 2007
3.

Reference Books

Open Source Software, P.Rizwan Ahmed, Margham Publication, Chennai, 2015

Core Practical

PRACTICAL – VII

ASP.NET Lab

1. Implement Validation Controls
2. Write a Program to implement ad rotator control
3. Write a Program to implement state management techniques
4. Write a Program to implement view State and Session State.
5. Write a Program to displaying data with the grid view
6. Write a Program to implement ASP.Net Server Side Controls.
7. Write a Program to implement ASP.Net Master Pages, Themes and Skins.
8. Write a Program working with forms using ASP.Net
9. Write a Program working with pages using ASP.Net.
10. Write a Program to access data sources through ADO.NET

Core Practical

PRACTICAL – VIII

Open Source Programming Lab

1. Create a web page with Frames and Tables.
2. Create a web page incorporating CSS (Cascading Style Sheets)
3. Write a shell program to find the factorial of an integer positive number
4. Write a shell program for checking whether a given string is a palindrome or not.
5. Create a simple calculator in Java script.
6. Write a JavaScript program to scroll your name in the scroll bar.
7. Develop a program and check message passing mechanism between pages.
8. Develop a program and check file system functions, date &time functions.
9. Create a student database table in MYSQL and manipulate records (insert, delete, update) records in a web browser.
10. Develop a program using cookies and session.

Elective II PAPER – 2

(A) SOFTWARE TESTING

Objective: To make the student more proficient with error free software development

UNIT-I PRINCIPLES OF TESTING

A test in time - The cat and the saint - Test the tests first - The Policemen on the bridge - Phase of software project - Quality, Quality Assurance and Quality Control - Testing, Verification and Validation -Process model to represent different phases - Life cycle models.

UNIT-II BLACK BOX AND WHITE BOX TESTING

White box testing - Challenges - Static testing - Structural testing - Black box testing.

UNIT-III INTEGRATION, SYSTEM AND ACCEPTANCE TESTING

Integration testing - Types - Phase of testing - Scenario testing - Defect bash - System and Acceptance testing: Overview - Functional vs. Non-Functional testing - Functional system testing - Non-functional testing-Acceptance testing.

UNIT-IV PERFORMANCE AND REGRESSION TESTING

Introduction - Factors Governing - Methodology for Performance testing - Tools and Process for Performance Testing - Regression Testing - Types of Regression testing - How to do Regression Testing?

UNIT-V INTERNATIONALIZATION AND ADHOC TESTING

Introduction to Internationalization - Primer on Internationalization - Test phases for Internationalization testing - Enabling testing - Locale testing - Internationalization Validation- Fake language testing - Language testing - Localization testing - Tools used for Internationalization - Challenges and Issues - Overview of Ad Hoc testing - Buddy, Pair, Exploratory, Iterative, Agile and Extreme Testing - Defect Seeding.

TEXT BOOK:

1. Srinivasan Desikan, Gopalaswamy Ramesh, “Software Testing: Principles and Practices”, Pearson Publications, 2006.

REFERENCES:

1. RenuRajani, Pradeep Oak, “Software Testing- Effective Methods, Tools and Techniques”, Tata McGraw Hill, 2004.
2. Boris Beizer, “Software Testing Techniques”, Dream Tech Press, Second Edition, 2003.

Elective II PAPER – 2

(B) MOBILE COMPUTING

Objective: To impart good knowledge of wireless communication to students

UNIT I **WIRELESS COMMUNICATION FUNDAMENTALS**

Cellular systems- Frequency Management and Channel Assignment- types of handoff and their characteristics, dropped call rates & their evaluation -MAC – SDMA – FDMA –TDMA – CDMA – Cellular Wireless Networks.

UNIT II **TELECOMMUNICATION NETWORKS & WIRLESS LAN**

Telecommunication systems – GSM – GPRS - Satellite Networks ,Wireless LAN – IEEE 802.11 - Architecture – services – MAC – Physical layer – IEEE 802.11a -802.11b standards – HIPERLAN – Blue Tooth.

UNIT III **MOBILE NETWORK LAYER & TRANSPORT LAYER**

Mobile IP – Dynamic Host Configuration Protocol - Routing – DSDV – DSR – Alternative Metrics. Traditional TCP, Mobile TCP

UNIT IV **APPLICATION LAYER**

WAP Model- Mobile Location based services -WAP Gateway –WAP protocols – WAP user agent profile- caching model-wireless bearers for WAP - WML – WML Scripts

UNIT V **DATABASE ISSUES**

Database Issues : Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

TEXT BOOKS:

1. Jochen Schiller, “Mobile Communications”, Second Edition, Pearson Education, 2003.
2. William Stallings, “Wireless Communications and Networks”, Pearson Education, 2002.

REFERENCE BOOKS:

1. KavehPahlavan, PrasanthKrishnamoorthy, “Principles of Wireless Networks”, PHI/Pearson Education, 2003.

2. UweHansmann, LotharMerk, Martin S. Nicklons and Thomas Stober, “Principles of Mobile Computing”, Springer, 2003..

Elective II PAPER – 2

C. MICROPROCESSORS AND ITS APPLICATIONS

Objective:
To learn the architecture, programming, interfacing and rudiments of system design of microprocessors.

Unit-I : 8085 MICROPROCESSOR AND ARCHITECTURE
Microprocessors - Memory - I/O Devices - Memory Mapped I/O - Pin diagram and internal architecture of 8085 - Registers, ALU, Control & Status Registers - Instruction and Machine Cycles. Interrupts

Unit II : PROGRAMMING THE 8085
Introduction to 8085 Assembly language programming - 8085 instructions - Programming techniques with Additional instructions - Counters and Time Delays - Stack and Subroutines - Code Conversions

Unit-III : 8086 MICROPROCESSOR AND ARCHITECTURE
Pin Details and Internal Architecture of 8086 - Register organization, Bus interface unit, Execution unit, Memory addressing, Memory segmentation. Operating modes - Hardware and Software interrupts - Addressing Modes.

Unit-IV : PROGRAMMING THE 8086
8086 Assembly Language Programming - Implementing Standard Program Structures - String - Procedure and Macros. Instruction Description and Assembler Directives

Unit-V : INTERFACING PERIPHERALS
8255 PPI , 8253/8254 PIT, 8237 DMAC,8259 PIC, 8251 USART.

TEXT BOOK

1. Microprocessor Architecture, Programming and Applications with 8085, Ramesh S.Gaonkar, Penram International Publishing (India) Pvt. Ltd. 4th Ed. (for Units I,II and V)
2. Microprocessors and Interfacing,Douglas V. Hall, Tata McGraw Hill , 2nd Ed. (for Units III and IV)

REFERENCE BOOKS:

1. Assembly Language Programming the IBM PC ,Alan R. Miller, SubexInc, 1987.
2. Advanced Microprocessors and Peripherals, Ray A K ,Bhurchandi K M , TMH.

Elective III PAPER – 3

(A) Internet of Things

Objective: To prepare the student for better application of internet technology.

Unit – I IoT Introduction

Introduction to Internet of Things: Definition – Characteristics of IOT – Physical Design of IoT – Things in IoT – IoT Protocols – Logical Design of IoT – Iot Functional Blocks – IoT Communication Models – IoT Communication APIs – IoT Enabling Technologies

Unit – II Domain Specific IoT - 1

Domain Specific IoT – I : Smart Lighting – Smart Appliances – Intrusion Detection – Smoke / Gas Detection – Smart Parking – Smart Roads – Structural Health Monitoring – Surveillance – Emergency Response – Weather Monitoring –

Unit – III Domain Specific IoT II

Domain Specific IoT – II : Air Pollution Monitoring – Noise Pollution Monitoring – Forest Fire Detection – River Flood Detection – Smart Grids- Smart Vending Machines – Route Generation & Scheduling – Fleet Tracking – Shipment Monitoring –

Unit – IV Domain Specific IoT III

Domain Specific IoT – III: Remote Vehicle Diagnostics – Smart Irrigation - Green House Control – Machine Diagnosis & Prognosis – Indoor Air Quality Monitoring – Health & Fitness Monitoring – Wearable Electronics

Unit – V IoT and M2M

IoT And M2M: M2M – Difference Between Iot And M2M – SDN And NFV For IoT – IoT System Management With NETCONF – YANG : Need For Iot Systems Management – SNMP-Network Operator Requirements – NETCONF – YANG-IoT Systems Management With NETCONF - YANG

Text Books:

1. Interconnecting Smart Objects with IP: The Next Internet, Jean-Philippe Vasseur, Adam

Dunkels, Morgan Kuffmann.

Reference

1. Internet of Things, P.Rizwan Ahmed, Margham Publications, Chennai.

2. Designing the Internet of Things , Adrian McEwen (Author), Hakim Cassimally

(B) System Software

Objective: To make the student to become more proficient with system programming

Unit – I LANGUAGE PROCESSORS

Language Processing Activities – Fundamentals of Language Processing – Fundamentals of Language Specification – Language Processor Development Tools.

UNIT II ASSEMBLERS AND MACRO

Elements of Assembly Language Programming – Overview of Assembly Process - Design of a Two – Pass Assembler - Macro Definition and Call – Macro Expansion – Nested Macro Calls.

UNIT III COMPILER I

Scanning: Finite State Automate – Regular Expressions – Building DFA – Performing Semantic Action – Writing a Scanner – Parsing: Parse Tree and Abstract Syntax Trees – Top Down Parsing – Bottom-Up Parsing.

UNIT IV COMPILER II AND INTERPRERTERS

Aspects of Compilation –Memory Allocation - Compilation of Expressions-Compilation of Control Structure-Code Optimization - Interpreters.

UNIT V LINKERS

Relocation and Linking Concepts – Design of a Linker – Self-Relocating Programs – Linking for Overlays - Loader.

TEXT BOOK

D.M. Dhamdhere, “System Programming And Operating Systems”, New Delhi: Tata McGraw-Hill Publishing Company Limited, 1993.

Elective III PAPER – 3

(C) Multimedia Systems

Objective :

This course presents the Introduction to Multimedia, Images & Animation and enable the students to learn the concepts of Multimedia.

UNIT I Introduction to Multimedia:

Introduction to Multimedia PCs – Components of Multimedia – Multimedia Tools Sound and Graphics : Digital Sound – Editing and Mixing sound files – MIDI creation – Tracking Procedure – Interactive and Non Interactive Graphics – High Resolution Graphics – Difference between TV and Computer Display.

UNIT II Video and Animation :

Digital Image concepts – Video Capturing – Scanning Images – Digital Filters Morphing and Warping – Two Dimensional and Three dimensional animation – Animation Tools – Layering technique – Blue Screen technique – Latest movie technologies – Motion Tracking System – Motion Capturing System.

UNIT III Creating Presentation:

Script Writing and creating interactive and non-interactive presentation – Linear and Non Linear Editing – Authoring Tools – File Formates SOUND, VIDEO, ANIMATION, Presentation Images. Multimedia Programming: Text Links – Hyper Text system – Form Creation – File storing - Error Trapping.

UNIT IV Sound Links:

Multimedia interfaces – MCI- API- High Level Multimedia Functions – WAVE , MIDI file processing. Animation : Color Palette – Events – ROPs.

UNIT V Imaging Special Visual Effects :

Bitmap – Brushes – Dissolve –Hotspot Editor – Scorlling. Media Control Interface : Simple Commands – API functions – CD Player – Video Capturing – Form – AVI Play Form.

Text Books :

1. Kaliyaperumal Karthikeyan,"Introduction to Multimedia System", LAP Lambert Academic Publishing, 2011
2. TayVaughan, "Multimedia Making It Work Eighth Edition", Tata McGraw-Hill Publishing Company, 2011
3. ParagHavaldarand Gerald Medioni, "Multimedia Systems", Cengage Learning, 2011
4. S. K. Bansal,"Multimedia Systems", Aph Publishing Corporation, 2011

Skilled Based Subject IV – Paper 4

ASP .NET

Objective: Students to become well aware of .NET technology

UNIT I : ASP.NET Basics

Introduction to ASP.NET: .NET Framework (CLR, CLI, BCL), ASP.NET Basics, ASP.NET Page Structure, Page Life Cycle. Controls: HTML Server Controls, Web Server Controls, Web User Controls, Validation Controls, Custom Web Controls.

UNIT II : Form

Form validation: Client side validation, Server side validation, Validation Controls: Required Field Comparison Range, Calendar Control, Ad rotator Control, Internet Explorer Control. State Management: View State, Control State, Hidden Fields, Cookies, Query Strings, Application State, Session State.

UNIT III : ADO.NET

Architecture of ADO. NET, Connected and Disconnected Database, Create Database, Create connection Using ADO.NET Object model, Connection Class, Command Class, Data Adapter Class, Dataset Class, Display data on data bound controls and Data Grid.

UNIT IV : Database accessing

Database accessing on Web Applications: Data Binding Concept with web, Creating Data Grid, Binding standard web server controls, Display data on web form using Data Bound Controls.

UNIT V : XML

Writing Datasets to XML, Reading datasets with XML. WEB services: Remote method call using XML, SOAP, Web service description language, Building and Consuming a web service, Web Application deployment.

Textbook:

Professional ASP.NET 1.1 Bill Evjen , Devin Rader , Farhan Muhammad, Scott Hanselman , SrivakumarWrox

REFERENCE BOOKS:

1. Introducing Microsoft ASP .NET 2.0 Esposito PHI
2. Professional ADO.NET BipinJoshi, Donny Mack, Doug Seven , Fabio Claudio Ferracchiati, Jan D Narkiewiez Wrox
3. Special Edition Using ASP.NET Richard Leineker Person Education
4. The Complete Reference ASP.NET Matthew MacDonald TMH
5. ASP.NET Black Book DreamTech