HIMALAYAN UNIVERSITY, ARUNACHAL PRADESH

BACHELOR OF SCIENCE

(INFORMATION TECHNOLOGY)

1st YEAR

1st Semester

S. NO.	SUB. CODE	SUBJECT NAME	MARKS			
			INTERNAL	THEORY	TOTAL	PASS
1	101	Introduction To Information Technology	30	70	100	40
2	102	Computer Architecture	30	70	100	40
3	103	Programming Methodology	30	70	100	40
4	104	Computer Network and Data Communication	30	70	100	40
5	105	Practical	30	70	100	40

2nd Semester

S. NO.	SUB. CODE	SUBJECT NAME	MARKS			
			INTERNAL	THEORY	TOTAL	PASS
1	201	Database Management System	30	70	100	40
2	202	Data Structure and Algorithms	30	70	100	40
3	203	Business Communication Skill	30	70	100	40
4	204	Operating System	30	70	100	40
5	205	Practical	30	70	100	40

2nd YEAR

3rd Semester

S. NO.	SUB. CODE	SUBJECT NAME	MARKS			
			INTERNAL	THEORY	TOTAL	PASS
1	301	Management Practices and Organizational Behavior	30	70	100	40
2	302	Computational Techniques	30	70	100	40
3	303	Internet and Applications	30	70	100	40
4	304	Object Oriented Programming Using C++	30	70	100	40
5	305	Practical	30	70	100	40

4th Semester

S. NO.	SUB. CODE	SUBJECT NAME	MARKS			
			INTERNAL	THEORY	TOTAL	PASS
1	401	Basics Computers & PC Packages	30	70	100	40
2	402	System Analysis And Design	30	70	100	40
3	403	Visual Programming	30	70	100	40
4	404	Operations Research Techniques	30	70	100	40
5	405	Industrial Training	30	70	100	40

3rd YEAR

5th Semester

S. NO.	SUB. CODE	SUBJECT NAME	MARKS			
			INTERNAL	THEORY	TOTAL	PASS
1	501	Mathematical Foundation For Computer Science	30	70	100	40
2	502	Programming in Java	30	70	100	40
3	503	Internet and Web Designing	30	70	100	40
4	504	Information System	30	70	100	40
5	505	Practical	30	70	100	40

6th Semester

S. NO.	SUB. CODE	SUBJECT NAME	MARKS			
			INTERNAL	THEORY	TOTAL	PASS
1	601	Distributed Computing	30	70	100	40
2	602	Advanced Java Programming	30	70	100	40
3	603	Programming Using C#	30	70	100	40
4	604	Software Quality Management and Testing	30	70	100	40
5	605	Practical	30	70	100	40

HIMALAYAN UNIVERSITY, ARUNACHAL PRADESH

BACHELOR OF SCIENCE

(INFORMATION TECHNOLOGY)

1st YEAR

1st SEM

Introduction To Information Technology (101)

Unit 1

Introduction to Computer Systems

Introduction to computers, Classification of digital computer systems, Anatomy of adigital Computer, Computer Architecture, Memory system, Memory Units, Auxiliary Storage devices, Inputs devices, Output Devices.

Unit 2

Computer Software and Software Development

Introduction to Computer Software, Operating Systems, Programming Languages, General Software Features and Trends

Unit 3

Database Management

Data processing, Introduction to Database Management systems, Database design

Unit 4

Telecommunications

Introduction to Telecommunications, Computer Networks, Communication Systems,Distributed systems

Unit 5

Internet and New Technologies in Information Technology

Internet, Multimedia tools and system, Intranets, Electronic Commerce, Hypermedia,Data Warehouses and Data Marts, Data Mining, Geographical Information System.

Unit 6

Applications of Information Technology

Computers in Business and Industry, Computers in education, training, Computers inEntertainment, science, medicine and Engineering

Laboratory works: The main objective is familiarizing students with operating system and desktop applications using current version of windows.

Text / Reference books:

Alexis Leon, Mathews Leon, Fundamentals of Information Technology, Leon TechWorld

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Computer Architecture (102)

UNIT 1

COMPUTER EVOLUTION

1.Pentium and power pc evolution

2.Computer system components

3.Functions

4.Inter connection structure

5.Bus inter connection

6.Basics of PCI bus

MEMORY

7.Characteristics

8.Hierarchy

9.Cache memory

10.Principles

11.Cache design

12.Locality of reference

UNIT 2

MAIN MEMORY

1.Static RAM

2.Dynamic RAM

3.Types of ROM

4.Memory chip organization

5.Types of DRAM

EXTERNAL MEMORY

6.Magnetic disk

7.Basics of RAID

8.Optical memory

9.Magnetic tapes

UNIT 3

INPUT & OUTPUT

1.External devices

2. I\O Module

3. Programmed I\O

4.Interrupt

5.Driven I\O

6.DMA

7. I\O channels and processors

COMPUTER ARITHMETIC

8.Floating point representation

9.Arithmetic

INSTRUCTION SET

10.Characteristic

11.Operand types

12.Operation types

13.Addressing mode

14.Instruction format

15.Pentium and power PC operand

16.Operations

UNIT 4

1.Organization of processors of registers

2.Instruction cycle

3.Instruction pipe lining

 4.Pentium processor

5.Characteristic – Large register cycle

6.Register optimization

7.architecture

8.RISE V\S CISE characteristic

9.pipe ling

UNIT 5

1.Micro operations

2.Control of processors

3.Hardware implementation

4.Micro programmed control unit

5.Micro instruction6.Sequencing

7.General micro-instruction execution

TEXTBOOKS:

1. John P.Hayes, 'Computer architecture and Organisation', Tata McGraw-Hill, Third edition, 1998.

2. V.Carl Hamacher, Zvonko G. Varanesic and Safat G. Zaky, " Computer Organisation", V edition, McGraw-Hill Inc, 1996.

Programming Methodology (103)

Unit I

Introduction to Computer and Languages, OOPS and Software development:

Software Engineering and SDLC. Java Basics: Program Components, Compilation cycle. Introduction to Applet and Application, Data types and Variables

Unit II

Operators:

Arithmetic operators, relational operators, Assignment operators Control statement: Selection statement: if, nested if, switch statement. Repetition statements: while, do-while, for, nested loops. Introduction to Math class Arrays: Basics, One dimensional, Multidimensional, Array of Objects, Passing array to method.

Unit III

Introducing classes, class fundamentals,

declaring objects, methods, class data,& instance data, constructor, this keyword, access control, Introduction to String and String Buffer classes

Unit IV

Applet class and its methods, Introduction to AWT, AWT classes: Button, TextField, Label. Working with Graphics, Working with colors, AWT controls, Fundamentals: Adding and removing controls, responding to control

Unit V

Event handling:

Event handling mechanism, Delegation Event model, Event, EventListener: ActionListener, mouse Listener, mouse Motion Listener, window Listener, Using delegation

Event model: Handling mouse events, Adapter classes, Inheritance, Polymorphism, Abstract classes and Interface, Packages

Unit VI

Java File I/O: File, FileDialog object, Low and High level File I/O, the Stream classes, Byte Stream: Input stream, Output stream, File Input stream, File Output stream, Data Input stream, Data Output stream, PrintWriter, Exception handling: Exception types, uncaught Exceptions using try and catch, throw, throws, finally. GUI objects programming: Frame class, menus and other GUI objects.

TEXT BOOKS:

1) Herbert Scheldt : Java Complete References(McGraw Hill)

2) C.Thomas Wu: An Introduction to OOP with Java(McGraw Hill)

REFFERENCES

1) Liag: Java Programming (PHI)

Computer Network and Data Communication (104)

UNIT I

Introduction:

Data Communications, Networks, The Internet, Protocols and Standards, Network Models, Layered Tasks, The OSI Model, Layers in the OSI Model, TCP/IP Protocol Suite, Addressing, Physical Layer and Media, Data and Signals, Analog and Digital, Periodic Analog Signals, Digital Signals, Transmission impairment, Data Rate Limits, Performance, Digital Transmission, Digital-to-Digital Conversion, Analog-to-Digital Conversion, Analog Transmission, Digital-to-analog Conversion, Analog-to-analog Conversion

UNIT II

Bandwidth utilization: Multiplexing and Spreading, Multiplexing, Spread Spectrum, Transmission Media, Guided Media, Unguided Media: Wireless, Switching, Circuit-Switched Networks, Datagram Networks, Virtual-Circuit Networks, Structure of a Switch,

Using Telephone and Cable Networks for Data Transmission, Telephone Networks, Dial-up Modems, Digital Subscriber Line, Cable TV Networks, Cable TV for Data Transfer

UNIT III

Error Detection and Correction, Introduction, Block Coding, Liner Block Codes, Cyclic Codes, Checksum, Data Link Control, Framing, Flow and Error Control, Protocols, Noiseless Channels, HDLC, Point-to-Point Protocol, Multiple Access, Random Access, Aloha, Controlled Access, Channelization, IEEE Standards, Standard Ethernet, Changes in the Standard, Fast Ethernet, Gigabit Ethernet, IEEE 802.11, Bluetooth

UNIT IV

Connecting LANs, Backbone Networks, and Virtual LANs, Connecting Devices, Backbone Networks, Virtual LANs, Cellular Telephony, Satellite Networks, Sonet/SDH, Architecture, Sonet Layers, Sonet Frames, STS Multiplexing, Sonet Networks, Virtual Tributaries, Virtual-Circuit Networks: Frame Relay and ATM, Frame Relay, ATM, ATM LANs

UNIT V

Network Layer: Logical Addressing, IPv4 Addresses, IPv6 Addresses, Network Layer: Internet Protocol, Internetworking, IPv4, IPv6, Transition from IPv4 to IPv6, Network Layer: Adress Mapping, Error Reporting and Multicasting, Address Mapping, ICMP, IGMP, ICMPv6, Network Layer: Delivery, Forwarding and Routing, Delivery, Forwarding, Unicast Routing Protocols, Multicast Routing Protocols

UNIT VI

Transport Layer:

Process-Process Delivery: UDP, TCP and SCTP, Process-to-Process Delivery, User Datagram Protocol (UDP), TCP, SCTP, Congestion Control and Quality of Service, Data Traffic, Congestion, Congestion Control, Two Examples, Quality Service, Techniques to improve QoS, Integrated Services, Differentiated Services, QoS in Switched Network

UNIT VII

Application Layer:

Domain Name System, Name Space, Domain Name Space, Distribution of Name Space, DNS in the Internet, Resolution, DNS Messages, Types of Records, Registrars, Dynamic Domain Name System (DDNS), Encapsulation, Rmote Logging, Electronic Mail and File Transfer, Remote Logging, Telnet, Electronic Mail, File Transfer

UNIT VIII

WWW and HTTP:

Architecture, Web Documents, HTTP, Network Management: SNMP, Network Management System, Simple Network Management Protocol (SNMP), Multimedia, Digitizing Audio and Video, Audio and Video Compression, Streaming Stored Audio/Video, Streaming Live Audio/Video, Real-Time Interactive Audio/Video, RTP, RTCP, Voice over IP

TEXT BOOKS:

1. Data Communications and Networking, Fourth Edition by Behrouza A. Forouzan,TMH.

2. Computer Networks,A.S.Tanenbaum,4th edition,Pearson education.

REFERENCE BOOKS:

1.Introduction to Data communications and Networking,W.Tomasi,Pearson education.

2. Data and Computer Communications,G.S.Hura and M.Singhal,CRC Press,Taylor and

   Francis Group.

3. An Engineering Approach to Computer Networks-S.Keshav,2nd Edition,Pearson

   Education.

4. Understanding communications and Networks,3rd Edition, W.A.Shay,Cengage Learning.

Practical (105)

1st YEAR

2nd SEM

Database Management System (201)

UNIT I

INTRODUCTION TO DBMS

File Systems Organization – Sequential, Pointer, Indexed, Direct – Purpose of Database System- Database System Terminologies-Database characteristics- Data models – Types of data models – Components of DBMS- Relational Algebra.

LOGICAL DATABASE DESIGN

Relational DBMS -Codd's Rule – Entity-Relationship model – Extended ER Normalization – Functional Dependencies, Anomaly- 1NF to 5NF- Domain Key Normal Form – Demoralization

UNIT II

SQL & QUERY OPTIMIZATION

SQL Standards – Data types – Database Objects- DDL-DML-DCL-TCL-Embedded SQL-Static Vs Dynamic SQL – QUERY OPTIMIZATION: Query Processing and Optimization – Heuristics and Cost Estimates in Query Optimization.

UNIT III

TRANSACTION PROCESSING AND CONCURRENCY CONTROL

Introduction-Properties of Transaction- Serializability- Concurrency Control – Locking Mechanisms- Two Phase Commit Protocol-Dead lock.

UNIT IV

TRENDS IN DATABASE TECHNOLOGY

Overview of Physical Storage Media – Magnetic Disks – RAID – Tertiary storage – File Organization – Organization of Records in Files – Indexing and Hashing –Ordered Indices – B+ tree Index Files – B tree Index Files – Static Hashing – Dynamic Hashing – Introduction to Distributed Databases- Client server technology- Multidimensional and Parallel databases-Spatial and multimedia databases- Mobile and web databases- Data Warehouse-Mining-Data marts.

UNIT V

ADVANCED TOPICS

DATABASE SECURITY: Data Classification-Threats and risks – Database access Control – Types of Privileges –Cryptography- Statistical Databases.- Distributed Databases-Architecture-Transaction Processing-Data Warehousing and Mining-Classification-Association rules-Clustering-Information Retrieval- Relevance ranking-Crawling and Indexing the Web- Object Oriented Databases-XML Databases.

TEXT BOOK:

1. Ramez Elmasri and Shamkant B. Navathe, "Fundamentals of Database Systems", Fifth

   Edition, Pearson Education, 2008

REFERENCES:

1. Abraham Silberschatz, Henry F. Korth and S. Sudharshan, "Database System Concepts", Sixth Edition, Tata Mc Graw Hill, 2011.

2. C.J.Date, A.Kannan and S.Swamynathan, "An Introduction to Database Systems", Eighth Edition, Pearson Education, 2006.

3. Atul Kahate, "Introduction to Database Management Systems", Pearson Education, New Delhi, 2006.

4. Alexis Leon and Mathews Leon, "Database Management Systems", Vikas Publishing House Private Limited, New Delhi, 2003.

5. Raghu Ramakrishnan, "Database Management Systems", Fourth Edition, Tata Mc Graw Hill, 2010.

6. G.K.Gupta, "Database Management Systems", Tata Mc Graw Hill, 2011.

7. Rob Cornell, "Database Systems Design and Implementation", Cengage Learning, 2011

Data Structure and Algorithms (202)

1.Introduction

- Introduction and Motivation
- Lower Bound
- Example
- Asymptotic Notations
- Mathematical Induction
- Mathematical Models

2.Algorithm Analysis Techniques

- Formulation the Equations
- Solving the equations
- Homogeneous Linear Recurrence with Constant Coefficients
- Non-homogeneous Equations

- Transformations

3.Basic Abstract Data Types

- Linear Lists
- Stacks
- Queues
- Mappings
- Stack and Recursive Procedures
-

4.Trees Structures

- Basic Terminology
- ADT Tree
- Implementations
- Binary Trees

5.Basic Operations on Sets

- Introduction
- An ADT with Union, Intersection and Difference
- Bit Vector Implementations
- Linked List Implementation
- Dictionary
- Simple Dictionary Implementations
- Hash Table Data Structures
- Efficiency of Hashing
- Priority Queues
- Complex Set Structures

6.Dynamic Hashing

- Introduction
- Dynamic Hashing
- Extensible Hashing
- Linear Hashing

7.Advanced Set Representation Methods

- Binary Search Trees
- Time Analysis
- Optimum Binary Search Trees
- An Approximation Algorithm
- Tries
- Balanced Trees
- Sets with Merge and Find

8. ADT with Merge & Split

- B-Trees
- B-Tree Variants
- B-Trees in a Multiuser Environment
- Fringe Analysis

9. Directed Graphs

- Basic Definitions
- Representations for Directed Graphs
- The Single-Source Shortest Path Problem
- All-Pairs Shortest Paths Problem
- Depth-First Spanning Forest
- Direct Acyclic Graphs
- Strong Components

10. Undirected Graphs

- Definitions
- Minimum-Cut Spanning Trees
- Traversal
- Articulation Points & Biconnected Components
- Graph Matching

11. Sorting

- Internal Sorting Model
- Simple Sorting Algorithms

- Quicksort
- Heapsort
- Bin Sort
- A Lower bound for sorting by Comparisons
- Order Statistics

12. Algorithm Design Techniques

- Divide and Conquer
- Dynamic Programming
- Greedy Method
- Backtracking Algorithm
- Local Search Approximation

13. Lower Bound Theory

- Definition
- Decision Tree Method
- Oracle Method
- State Space Method

14. P and NP

- Definitions

Textbook:

- Elliot Koffman, Paul Wolfgang, Objects, Abstraction, Data Structures and Design Using C++, Wiley, 2005.

Other Books:

- M. A. Weiss, Data Structures and Algorithm Analysis in C++, Addison Wesley, 2006.
- Cormen, Leiserton, Rivest, Introduction to Algorithms, MIT Press, 2001.
- Sahni, Data Structures, Algorithms and Applications in C++, McGraw-Hill, 1998.
- Horowitz, Sahni, Rajasekaran, Computer Algorithms, Computer Science Press, 1998.

Business Communication Skill (203)

Unit – I

Completeness, Conciseness, Consideration, Concreteness, Clarity, Courtesy, Correctness

Unit- II

Communication: Its interpretation

Basics, Nonverbal Communication, Barriers to Communication

Unit-III

Business Communication at Work Place:

Letter Components and Layout, Planning a letter, Process of Letter writing, E-mail Communication, Memo and Memo reports, Employment Communication, Notice agenda and Minutes of meeting, Brochures

Unit-IV

Report Writing

Effective writing, types of business reports, structure of reports, gathering information, organization of the material, writing abstracts and summaries, writing definitions, visual aids, user instruction manual.

Unit -V

Required Skills

Reading skills, listening skills, note-making, précis writing, audiovisual aids, oral communication

Unit-VI

Mechanics of Writing

Transitions, Spelling rules, hyphenation, transcribing numbers, Abbreviating technical and non-technical terms, Proof reading.

Books:

Professional Communication by Aruna Koneru, McGrawHill

Effective Business Communication by Herta A Murphy, Herbert W Hildebrandt, Jane P Thomas, McGrawHill

References:

Business Communication, Lesikar and Petit, McGrawHill

Communication Skills Handbook, summers, Wiley, India

Business Communication (Revised Edition), Rai and Rai, Himalaya Publishing House

Business Correspondence and Report Writing by R. C. Sharma and Krishna Mohan, TMH

Operating System (204)

Unit-I

Operating System Introduction-

what is an operating system, History of OS, OS concepts, Types of OS, OS Structure, System calls and Types Processes- Introduction to process, Inter-process Communication, Process Scheduling

Unit-II

Memory Management-

Introduction, Swapping, Contiguous Memory Allocation, Paging, Segmentation, Virtual Memory Management- Demand Paging, Page Replacement

Unit-III

Deadlock- Prevention, Avoidance, Detection, Recovery, Algorithms

Unit-IV

Case Study of Unix

(a) Unix Operating System Overview- Unix System Architecture, Operating System

Services, General Unix Commands like ls, cp, etc, Unix Utilities like grep , wc etc.

(b) Fundamentals of Unix shell programming - functions, variables, special symbols,

looping and decision making, Test command, error checking in shell programming

(c) Introduction to "vi editor", Features, Use of various keys , and overall using vi editor for

editing text.

(d) Security in Unix - Password, File Permissions, Directory Permissions.

SUGGESTED BOOKS

1. Operating Systems with case Studies by Achyut S Godbole,TMG.

2. Operating System Principles , Arbraham Silberschatz & Peter Baer Galvin

3. Working With Unix Vijay Mukhi , BPB Publication.

4. The Unix Programming Environment , Pike rob & Kerningham Brain.

Practical (205)

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2nd YEAR

3rd SEM

Management Practices Organizational Behavior (301)

Management Practices

Unit-I

Definition, Functions, Process, Scope and Significance of Management Nature of Management, Managerial Roles and Skills, Difference between Management and Administration Social Responsibilities of business, Management by Objectives

Unit-II

Evolution of Management Thought, Planning and Organizing: Nature, Scope, Objective and Significance, Elements and Steps of Planning, Decision Making, Organizing Principles, Span of Control, Line and Staff Relationship, Authority, Delegation and Decentralization. Effective Organizing, Organizational Structures, Formal and Informal Organizations, Staffing

Unit-III

Directing, Supervision, Motivation, Different Theories of Motivation- Maslow, Herzberg, Mc Clelland, Vroom, Porter, Job Satisfaction. Concept of Leadership- Theories and Styles Communication Process, Channels and Barriers, Effective Communication

Unit-IV

Controlling and Coordinating- Elements of Managerial Control, Control Systems, Management. Control Techniques, Effective Control Systems. Coordination Concept and Importance, Concept of Managerial Effectiveness, Stress management

Organizational Behavior

UNIT I

FOCUS AND PURPOSE

Definition, need and importance of organizational behaviour – Nature and scope – Frame work – Organizational behaviour models

UNIT II

INDIVIDUAL BEHAVIOUR

Personality – types – Factors influencing personality – Theories – Learning – Types of learners – The learning process – Learning theories – Organizational behaviour modification.

Miss behavior – Types – Management Intervention

Emotions - Emotional Labor – Emotional Intelligence – Theories.

Attitudes – Characteristics – Components – Formation – Measurement- Values.

Perceptions – Importance – Factors influencing perception – Interpersonal perception- Impression Management

Motivation – importance – Types – Effects on work behavior

UNIT III

GROUP BEHAVIOUR

Organization structure – Formation – Groups in organizations – Influence – Group dynamics – Emergence of informal leaders and working norms – Group decision making techniques – Team building - Interpersonal relations – Communication – Control.

UNIT IV

LEADERSHIP AND POWER

Meaning – Importance – Leadership styles – Theories – Leaders Vs Managers – Sources of power – Power centers – Power and Politics.

UNIT V

DYNAMICS OF ORGANIZATIONAL BEHAVIOUR

Organizational culture and climate – Factors affecting organizational climate – Importance

Job satisfaction – Determinants – Measurements – Influence on behavior Organizational change – Importance – Stability Vs Change – Proactive Vs Reaction change – the change process – Resistance to change – Managing change Stress – Work Stressors – Prevention and Management of stress – Balancing work and Life. Organizational development – Characteristics – objectives – Organizational effectiveness

TEXT BOOKS

1. Koontz "O" Donnel Weihrich - Elements of Management.

2. Koontz H, "O" Donnel C - Management-A Book of Reading.

3. Terry and Franklin - Principles of Management

4. Stoner - Principles of Management

5.Stephen P. Robins, Organisational Behavior, PHI Learning / Pearson Education,

   11th edition, 2008.

6. Fred Luthans, Organisational Behavior, McGraw Hill, 11th Edition, 2001

REFERENCES

1. Schermerhorn, Hunt and Osborn, Organisational behavior, John Wiley, 9th Edition, 2008.

2.Udai Pareek, Understanding Organisational Behaviour, 2nd Edition, Oxford Higher

   Education, 2004.

3 Mc Shane & Von Glinov, Organisational Behaviour, 4th Edition, Tata Mc Graw Hill,2007.

4. Hellrigal, Slocum and Woodman, Organisational Behavior, Cengage Learning, 11th

Edition 2007.

5. Ivancevich, Konopaske & Maheson, Oranisational Behaviour & Management, 7th edition,

   Tata McGraw Hill, 2008

Computational Techniques (302)

Solution of Algebraic and Transcendental equations - Bisection, Newton-Raphson Method, Matrices and Linear System of Equations - Gaussian Elimination , Gauss Jordan Method, Method of Factorization (LU Method), Gauss Seidel Method, Numerical Integration-Simpson's – 1/3 Rule, Simpson's - 3/8 Rule , Interpolation-Newton's Forward Interpolation Formula, Newton's Backward Interpolation Formula, Newton's Divided Difference Method, Differential Equation - Modified Euler's

References :

1. Brain W Keringhan and Dennis M Ritchie, ―The C Programming Language‖ 2nd edition,

   Eastern Economy Edition.

2. YeshavantKanetkar, ―Let Us C ‖, Seven Revised Edition, BPB Publications,2006.

3. S.S. Shastry, ―Numerical Analysis‖.

4. E. V. Krishamurthy& S.K. Sen, ―Numerical Algorithms – Computations in Science &

   Engineering ‖, Affiliated East West Press .

Internet and Applications (303)

Network Layer functions and protocols ; Switching; routing and congestion control; X.25; Internet protocol (IP); Addressing flow control, connection management, multiplexing, Transmission control protocol (TCP) and user datagram protocol (UDP), socket & TLI interface. Application layer services and Protocols : Domain name services network management protocol, electronic mail and file transfer protocol, worldwide   webs. Survey of contemporary Internet Technologies, The Role, use and implementation of current tools Basic TCP/IP, name, space, correctness, and protocols, worldwide/HTML Techniques for text, images, links and forms Indexing method : Gopher, WAIS, Server side programming, CGI scripts, Security issues, Emphasis on understanding, exploring and extending internet technologies using Java or perl.

References :

1. Comer Douglas E. : Computer Networks and Internets, Addison-Wesley.

Object Oriented Programming Using C++ (304)

Unit-I

Introduction to OOPs:

Need object oriented programming, comparison of procedural and object oriented approach, characteristics of OOPs – object, classes, polymorphism, inheritance, reusability, data hiding and abstraction, applications of OOPs

Unit-II

Classes and Objects:

Class declaration, constructors, constructor initialization lists, access functions, private member functions, the copy constructor, the class destructor ,constant objects, structures, pointers to objects, static data members, static function members

Unit-III

Operator Overloading:

overloading the assignment operator, the this pointer, overloading arithmetic operators, overloading the arithmetic assignment, operators, overloading the relational operators ,overloading the stream operators, conversion operators ,overloading the increment and decrement operators, overloading the subscript operator.

Unit-IV

Composition and Inheritance:

Inheritance, protected class members , overriding and dominating inherited members, private access verses protected access, virtual functions and polymorphism, virtual destructors, abstract base classes.

File Handling:

Classes for file stream operations, opening and closing a file, detecting end of file, file modes, file pointers and their manipulations, sequential input and output operations, random access, file operations error handling, command line argument.

Unit-V

Strings and Streams:

the string class interface, the constructors and destructor , the copy constructor, the assignment operator, the addition operator , an append operator, access functions , the comparison operators, stream operators,stream classes, the ios class, ios format flags, ios state , variables ,the istream andostream classes, unformatted input functions , unformatted output functions, stream manipulators.

Unit-VI

Templates and Iterators:

Function templates, class templates, container classes, subclass templates, passing template classes to template parameters, iterator classes.

Libraries:

The standard C++ library, proprietary libraries, contents of the standard c headers, string streams, file processing, the standard template library.

Books:

Schaum's Outline of Theory and Problems of Programming with C++ John R. Hubbard, TataMcGraw-Hill

Object Oriented Programming with C++, E.Balagurusamy,Fourth Edition, TataMcGraw-Hill

Object Oriented Programming with C++, by P. Sarang 2nd Edition,(PHI) EEE edition

Reference:

C++ programming , 3rd Edition, Bjarne Stroustrup Mastering C++, 2nd Edition,

 Venugopalan, TataMcgrawHill

C++ Programming, , Robert Lafore

C++ for Beginners, P. M. Harwani, X-Team Series

PRACTICAL (305)

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Basics Computers & pc Packages (401)

Unit – I

Evolution of an operating system, Define Operating system, objectives and functions of an operating system , the operating system as a resource manager, types of an operation system. Differentiate Dos, windows and linux/Unix.

Introduction to Windows-XP : Windows XP features, windows Desktop Setting, managing windows explorer.

UNIT -II

Windows-XP: Using Taskbar, Start Menu options, My Computer, Recycle Bin, My Network Place, My Documents.creating user Accounts in win-XP.

Windows Accessories: - Calculator, Note Pad, Word Pad, Paint, Entertainment, Address Book.

Unit – III

Control Panel: Installation of Software, Addition of new hardware, installation of modem, Sound card, Printers and Scanner, Date and time, taskbar and start menu.

Windows Explorer: Creating a new folders and other explore facilities, changing the look and feel of windows (Desktop, Wallpaper, Screen saver etc.).

Unit – IV

Linux: Features, Structure of file system, Linux system architecture(Kernel and Shell).

Linux Command: - How to create and manage a text file in linux, cat, pwd, ls, mkdir, cd, , rm, rmdir, cp, who, mv, tty, sty, chmod.

Utilities: more, file, cmp, comm., diff, passwd, uname, cal, bc. Filter and Pipe: pr, head, tail, grep, egrep, frep, tr.

Unit – V

MS-WORD: Define word processor ,types of word processor,creating document in MS word,formatting features of MS-word, word standard toolbar ,text formatting, header and

footer, auto text,document security features,table handling features, insertion of files and pictures ,mail merge and macros.

Books:

1. Microsoft windows XP STEP BY STEP - PHI

2. operating system – William stallings – pearson education

3. Unix operating System – sumitabha das – Tata McGraw hill

4. Introduction to computers – Norton – McGraw Hill

5. Microsoft office : Ron Mansdield – BPB publication

System Analysis And Design (402)

Unit

Overview. A short introduction to systems analysis and design and an explanation of the course activities and grading

Unit 1

An Introduction to Systems Development You will learn about the organizational and business context of systems development.

Unit 2

Approaches to Systems Development and Project Management You will learn to explain and apply systems development methodologies, models, tools and techniques for developing quality software. Furthermore, in this unit you will learn about project management in the context of systems development.

Unit 3

Systems Analysis Activities You will learn about how to define, prioritise, and evaluate requirements of an information system as well as build general and detailed models that specify the system requirements.

Unit 4

Essentials of Systems Design You will learn to describe, organize and structure the components of a system, including decisions about the system's hardware, software, and network environment. Furthermore, you will learn about designing effective user and system interfaces considering human-computer interaction principles.

Unit 5

Advanced Systems Design Concepts You will learn to apply object-oriented design in order to build detailed models that assist programmers in implementing the system.

Furthermore, you will learn how to store and exchange data in the system by considering database management and security issues, and creating database models and controls.

Unit 6

Making the System Operational You will learn about implementation, software testing and deployment issues.

Unit 7

Current Trends in System Development You will learn about emerging trends in systems development.

TEXT BOOKS

J. W. Satzinger, R. B. Jackson and S. D. Burd. *Systems Analysis and Design in a Changing World,* 6th ed.

Boston, USA: Thomson Course Technology, 2012. (ISBN-10: 1-111-53415-2 ISBN-13: 978-1-111-53415-8)

Visual Programming (403)

Unit 1

Windows Programming: Traditional Programming Paradigms – Overview of Windows Programming – Data Types – Resources – Windows Messages – Device Contexts – Document Interfaces – Dynamic Linking Libraries – Software Development Kit (SDK) Tools – Context Help.

Unit 2

Visual Basic Programming: Introduction – Forms – Variables, Types – Properties – Decision Making – Looping – Modules – Procedures – Functions-Tool Box Controls – Menus – Grid Controls – Dialog Boxes – Database Manager – Data Control – Record set Objects.

Unit 3

Visual C++ Programming: Objects – Classes - VC++ Components – Resources – Event Handling – Menus – Dialog Boxes – Importing VBX Controls – Files – MFC File Handling – Document View Architecture – Serialization.

Unit 4

Interfacing Other Applications – Multiple Document Interface (MDI) – Splitter Windows – Exception Handling – Debugging – Object Linking and Embedding (OLE) – Database Application – DLL – ODBC

TEXT BOOK:

1. Richard C.Leinecker and Tom Archer, "Visual C++ 6 Programming Bible", Wiley DreamTech Press, 2006

REFERENCES:

1. Lars Klander, "Core Visual C++ 6", Pearson Education, 2000
2. Deital, Deital, Liperi and Yaeger "Visual V++ .NET How to Program" , Pearson Education, 2004.

Operations Research Techniques (404)

Unit-I

LINEAR MODEL

The phases of OR study – formation of an L.P model- graphical solution – simplex algorithm – artificial variables technique– Big M method, two phase method.

Unit-II

TRANSPORTATION PROBLEM

Optimal solution by north west corner method- least cost method – vogels approximation method – optimality test – MOBI method. Assignment problem – formulation – Hungarian method. -unbalanced assignment problem.

Unit-III

NETWORK MODELS

Shortest route – minimal spanning tree - maximum flow models – project network- CPM and PERT network-critical path scheduling

Unit-IV

REPLACEMENT MODELS

Replacement of items that deteriorate with time – value of money changing with time –not charging with time – optimum replacement policy – individual and group replacement. Sequencing problem: models with n jobs with 2 machines – problem with n jobs with 3 machines

Unit-V

QUEUING THEORY

Queuing models – queuing systems and structures – notation –parameter – single server and multiserver models – Poisson input – exponential service – constant rate service – infinite population

TEXT BOOK

1. Taha H.A, "Operation Research", Pearson Education sixth edition, 2003

REFERENCES

1. Hira and Gupta "Introduction to Operations Research", S.Chand and Co.2002

2. Hira and Gupta " Problems in Operations Research", S.Chand and Co, 2002.

3. Panneerselvam, "Operations Research" Prentice Hall Of India, 2003.

4. Wagner, "Operations Research", Prentice Hall Of India, 2000.

Industrial Training (405)

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3rd YEAR

5th SEM

Mathematical Foundation For Computer Science (501)

UNIT - I

Prepositional and predicate calculus: Logic Propositions and logical operations truth tables and proposition generated by a set equivalence and implication. The laws of first order predicate logic, mathematical systems. Fuzzy sets, operations on fuzzy sets, Fuzzy Relations, properties and operations on fuzzy relations.

UNIT - II

Relations : Definitions, graphs of relations, properties of relations, matrices of relations, equivalence relations, Posets, Lattices , Complemented Lattices, Sub lattices. Distributive and Modular lattices. Boolean Algebra

UNIT - III

Graph Theory: Notions & terminology, directed and undirected graphs, incidence and degrees, Sub-graphs, Walks paths, cycles, circuits, components, connectedness algorithms, shorter path algorithm. Euclidian and Hamiltonian graphs, the traveling Salesman Problem, Trees: Spanning trees, rooted trees and binary trees.

UNIT - IV

Discrete numeric functions, Generating functions, Recursion and recurrence relation, many faces of recursion, sequences solving a recurrence relation including non-homogeneous finite order linear relations.

UNIT - V

Coding Theory, Binary symmetric channel, Coding Process, decoding, error detection and correction codes Vector Spaces: Linear Independence, bases, Subspaces, dimensionality, Linear mapping, linear in-equality, inner products, norms.

TEXT BOOK

Applied Discrete Structures for Computer Science by A Doerr and K Levasser

Text & Reference Books

1) Discrete Mathematical Structures for Computer Science by B Kolman & R.C. Busby.

2) Discrete Mathematical Structures with Application to Computer Science by J.P. Trembley

& R.P.Manohar.

3) Graph Theory by F.Harary.

4) Elements of Discrete Mathematics by C.Liu.

5) Graph Theory with Application to Computer Science by N.Deo.

Programming in Java (502)

UNIT I

Object oriented programming concepts – objects – classes – methods and messages – abstraction and encapsulation – inheritance – abstract classes – polymorphism.- Objects and classes in Java – defining classes – methods - access specifiers – static members – constructors – finalize method

UNIT II

Arrays – Strings - Packages – Java-Doc comments –- Inheritance – class hierarchy – polymorphism – dynamic binding – final keyword – abstract classes

UNIT III

The Object class – Reflection – interfaces – object cloning – inner classes – proxies - I/O Streams - Graphics programming – Frame – Components – working with 2D shapes.

UNIT IV

Basics of event handling – event handlers – adapter classes – actions – mouse events – AWT event hierarchy – introduction to Swing – Model-View-Controller design pattern – buttons – layout management – Swing Components – exception handling – exception hierarchy – throwing and catching exceptions.

UNIT V

Motivation for generic programming – generic classes – generic methods – generic code and virtual machine – inheritance and generics – reflection and generics - Multi-threaded programming – interrupting threads – thread states – thread properties – thread synchronization – Executors – synchronizers.

TEXT BOOK

1. Cay S. Horstmann and Gary Cornell, "Core Java: Volume I – Fundamentals", Eighth
   Edition, Sun Microsystems Press, 2008.

REFERENCES

1. K. Arnold and J. Gosling, "The JAVA programming language", Third edition, Pearson
   Education, 2000

2. Timothy Budd, "Understanding Object-oriented programming with Java", Updated
   Edition, Pearson Education, 2000

3. C. Thomas Wu, "An introduction to Object-oriented programming with Java", Fourth
    Edition, Tata McGraw-Hill Publishing company Ltd., 2006.

Internet and Web Designing (503)

Unit - I

Concept of Internet

A brief Introduction to the Internet: Computer Networks, Internet, URL (Uniform Resource Locator), Internet Service Provider, Intranet, Extranet, Virtual Private Network.

Application of Internet: World Wide Web, Search Engines, News groups, Electronic Mail, Web Portal, Chat, Video Conferencing, FTP, Remote Login, E-Commerce, E-Learning, E-Governance, E-Banking.

Unit - II

Static Web Page Development

Basics of HTML: What is Internet Language?, Understanding HTML, Create a Web page, Linking to other Web Pages, Publishing HTML Pages, Text Alignment and Lists, Text Formatting Fonts Control, Email Links and link within a Page, Creating a Table, Creating HTML Forms, Creating Web Page Graphics, Putting Graphics on a Web Page, Custom Backgrounds and Colors, Creating Animated Graphics.

Unit - III

Dynamic Web page Development

Cascading Style Sheet: CSS, Defining Style with HTML Tags, Features of Style Sheet, Style Properties, Style Classes, External Style Sheet

Unit - IV

JavaScript

Introduction to JavaScript: Writing First Java Script, External JavaScript, Variables: Rules for variable names, Declaring the variable, Assign a value to a variable, Scope of variable, Using Operators, Control Statements, JavaScript loops, JavaScript Functions: Defining a Function, Returning value from function, User define function.

Text Books:

1. Internet and Web Design Based on DOEACC III Revised syllabus 'O' Level Mac Millan India Ltd.

2. Teach Yourself HTML 4 in 24 Hours By Dick Oliver (Tech media) 4th edition

3. The Complete Reference JavaScript By Thomas Powell & Fritz Schneider 2nd Edition.

4. Introduction to Internet and HTML Scripting By Bhaumik Shroff, Books India Publ.

Reference Books :

1. HTML and CSS By Dick Oliver and Michael Morrison (Pearson Education) 7th edition

2. HTML, DHTML, JavaScript, Perl CGI By Ivan Bayross(BPB) 3rd Edition

3. CSS By Kynn Bartlett(Pearson Education)2nd Edition

4. Introduction to Internet & HTML Scripting By Bhaumik Shroff Books India Publication 3rd Edition

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Information System (504)

Unit-I

Information concepts, system & modeling concepts, what is information system, business information system, system development, need to learn information system, organization & information system, competitive advantage, performance based information system, careers in information systems.

Unit-II

H/W: Component, processing & memory devices, secondary storage, input and output devices

S/W: Overview of S/W, system & application S/W, programming languages, S/W issues & trends

Unit-III

Data management, data modeling and database models, database management systems, database applications

Unit-IV

Overview of Communication systems, telecommunication, network & distributed processing, telecommunication & application Use & functioning of the Internet, Internet services, WWW, intranets & extranets, Net issues

Unit-V

Introduction to E-Commerce, types of e-commerce, e-commerce, e-commerce application, Electronics Payment System, technologically infrastructure of E-Commerce, trends to E-Commerce, strategy for successive E-Commerce

Computer Waste and Mistakes, computer crimes, privat..?, work environment

Books:

1. Principal of Information System: Ralph Stair (Thomson course technology)

Practical (505)

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3rd YEAR

6th SEM

Distributed Computing (601)

UNIT-I

Fundamentals

Evolution of Distributed Computing Systems, System models, issues in design of Distributed Systems, Distributedcomputing environment, web based distributed model, computer networks related to distributed systems and web based protocols.

UNIT-II

Message Passing

Inter process Communication, Desirable Features of Good Message-Passing Systems, Issues in IPC by Message, Synchronization, Buffering, Multidatagram Messages, Encoding and Decoding of Message Data, Process Addressing, Failure Handling, Group Communication.

UNIT-III

Remote Procedure Calls

The RPC Model, Transparency of RPC, Implementing RPC Mechanism, Stub Generation, RPC Messages, Marshaling Arguments and Results, Server Management, Communication Protocols for RPCs, Complicated RPCs, Client-Server Binding, Exception Handling, Security, Some Special Types of RPCs, Lightweight RPC, Optimization for Better Performance.

UNIT-IV

Distributed Shared Memory

Design and Implementation issues of DSM, Granularity, Structure of Shared memory Space, Consistency Models, replacement Strategy, Thrashing, Other Approaches to DSM, Advantages of DSM.

UNIT-V

Synchronization

Clock Synchronization, Event Ordering, Mutual Exclusion, Election Algorithms.

UNIT-VI

Resource and Process Management

Desirable Features of a good global scheduling algorithm, Task assignment approach, Load Balancing approach, Load Sharing Approach, Process Migration, Threads, Processor allocation, Real time distributed Systems.

UNIT-VII

Distributed File Systems

Desirable Features of a good Distributed File Systems, File Models, File Accessing Models, File-shearing Semantics, Filecaching Schemes, File Replication, Fault Tolerance, Design Principles, Sun's network file system, Andrews file system, comparison of NFS and AFS.

UNIT-VIII

Naming

Desirable Features of a Good Naming System, Fundamental Terminologies and Concepts, Systems-Oriented Names, Name caches, Naming & security, DCE directory services.

UNIT-IX

Case Studies

Mach & Chorus (Keep case studies as tutorial) Term work/ Practical: Each candidate will submit assignments based on the above syllabus along with the flow chart and program listing will be submitted with the internal test paper.

References:

1. Distributed OS by Pradeep K. Sinha (PHI)

2. Tanenbaum S.: Distributed Operating Systems, Pearson Education

3. Tanenbaum S. Maarten V.S.: Distributed Systems Principles and Paradigms, (Pearson

Education)

4. George Coulouris, Jean Dollimore. Tim Kindberg: Distributed Systems concepts and

design.

Advanced Java Programming (602)

UNIT I

Servlet overview – the Java web server – your first servlet – servlet chaining – server side includes- Session management – security – HTML forms – using JDBC in servlets – applet to servlet communication.

UNIT II

Java Beans: The software component assembly model- The java beans development kit-developing beans – notable beans – using infobus - Glasgow developments - Application Builder tool- JAR files-Introspection-Bound Properties-Persistence-customizers - java beans API.

UNIT III

EJB: EJB architecture- EJB requirements – design and implementation – EJB session beans-EJB entity beans-EJB Clients – deployment tips, tricks and traps for building distributed and other systems – implementation and future directions of EJB-Variable in perl- perl control structures and operators – functions and scope

UNIT IV

RMI – Overview – Developing applications with RMI:Declaring & Implementing remote interfaces-stubs & skeletons,Registering remote objects,writing RMI clients –Pushing data from RMI Servlet – RMI over Inter- ORB Protocol

UNIT V

JSP –Introduction JSP-Examining MVC and JSP -JSP scripting elements & directives-Working with variables scopes-Error Pages - using Java Beans in JSP Working with Java Mail-Understanding Protocols in Javamail- Components-Javamail API-Integrating into J2EE-Understanding Java Messaging Services-Transactions.

Text Books

(i) J. McGovern,R. Adatia,Y. Fain, 2003, J2EE 1.4 Bible, Wiley-dreamtech India Pvt. Ltd,

New Delhi.

(ii) H. Schildt, 2002, Java 2 Complete Reference, 5th Edition, Tata McGraw-Hill, New

Delhi.

Reference Books

(i) K. Moss, 1999, Java Servlets, Second edition, Tata McGraw Hill, New Delhi.

(ii) D. R.Callaway, 1999, Inside Servlets, Addison Wesley, Boston

(iii) Joseph O'Neil, 1998, Java Beans from the Ground Up, Tata McGraw Hill, New Delhi.

(iv) TomValesky, Enterprise JavaBeans, Addison Wesley.

(v)Cay S Horstmann & Gary Cornell, Core Java Vol II Advanced Features, Addison Wesley

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Programming Using C# (603)

UNIT I

INTRODUCTION TO Programming Using C#

Introducing Programming Using C#, Understanding .NET, overview of C#, Literals, Variables, Data Types, Operators, checked and unchecked operators, Expressions, Branching, Looping, Methods, implicit and explicit casting, Constant, Arrays, Array Class, Array List, String, String Builder, Structure, Enumerations, boxing and unboxing.

UNIT II

OBJECT ORIENTED ASPECTS OF C#

Class, Objects, Constructors and its types, inheritance, properties, indexers, index overloading, polymorphism, sealed class and methods, interface, abstract class, abstract and interface, operator overloading, delegates, events, errors and exception, Threading.

UNIT III

APPLICATION DEVELOPMENT ON .NET

Building windows application, Creating our own window forms with events and controls, menu creation, inheriting window forms, SDI and MDI application, Dialog Box(Modal and Modeless), accessing data with ADO.NET, DataSet, typed dataset, Data Adapter, updating database using stored procedures, SQL Server with ADO.NET, handling exceptions, validating controls, windows application configuration.

<center>**UNIT IV**</center>

WEB BASED APPLICATION DEVELOPMENT ON .NET

Programming web application with web forms, ASP.NET introduction, working with XML and .NET, Creating Virtual Directory and Web Application, session management techniques, web.config, web services, passing datasets, returning datasets from web services, handling transaction, handling exceptions, returning exceptions from SQL Server.

<center>**UNIT V**</center>

CLR AND .NET FRAMEWORK

Assemblies, Versoning, Attributes, reflection, viewing meta data, type discovery, reflection on type, marshalling, remoting, security in .NET

TEXT BOOKS:

1. Herbert Schildt, "The Complete Reference: C# 4.0", Tata Mc Graw Hill, 2012.

2. Christian Nagel et al. "Professional C# 2012 with .NET 4.5", Wiley India, 2012.

REFERENCES:

1. Andrew Troelsen , "Pro C# 2010 and the .NET 4 Platform, Fifth edition, A Press, 2010.

2. Ian Griffiths, Matthew Adams, Jesse Liberty, "Programming C# 4.0", Sixth Edition,

   O'Reilly, 2010

<center>**Software Quality Management and Testing (604)**</center>

<center>**UNIT I**</center>

INTRODUCTION TO SOFTWARE QUALITY: Software Quality – Hierarchical models of Boehm and McCall – Quality measurement – Metrics measurement and analysis – Gilb's approach – GQM Model

<center>**UNIT II**</center>

SOFTWARE QUALITY ASSURANCE: Quality tasks – SQA plan – Teams – Characteristics – Implementation – Documentation – Reviews and Audits Software Quality, Product versus Process Quality management, techniques to help enhance software quality,

<center>**UNIT III**</center>

QUALITY CONTROL AND RELIABILITY: Tools for Quality – Ishikawa's basic tools – CASE tools – Defect prevention and removal – Reliability models – Rayleigh model – Reliability growth models for quality assessment

UNIT IV

QUALITY MANAGEMENT SYSTEM: Elements of QMS – Rayleigh model framework – Reliability Growth models for QMS – Complexity metrics and models – Customer satisfaction analysis.

UNIT V

QUALITY STANDARDS: Need for standards – ISO 9000 Series – ISO 9000-3 for software development – CMM and CMMI – Six Sigma concepts. Software Validation and Verification and Quality plans

UNIT- VI

BASICS OF SOFTWARE TESTING: Human Errors and Testing; Software Quality; Requirements, Behaviour and Correctness; Correctness versus, Reliability; Testing and Debugging; Test Metrics. Software and Hardware Testing; Testing and Verification; Defect Management

UNIT – VII

STRUCTURAL TESTING: Overview; Statement testing; Branch testing; Condition testing, Path testing; Procedure call testing; Comparing structural testing criteria; The infeasibility problem. Use pairs; Data flow analysis; Classic analyses; From execution to conservative flow analysis; Data flow analysis with arrays and pointers;

UNIT – VIII

PROCESS: Test and analysis activities within a software process: The quality process; Planning and monitoring; Quality goals; Dependability properties; Analysis; Testing; Improving the process; Organizational factors. Acceptance and Regression Testing:

REFERENCES:-

1. Software Project Management : Bob Hughes and Mike Cotterell-Tata McGraw Hill

2. Software Engineering a Practitioner's approach – Roger S Pressman Tata McGraw Hill,

3. Introduction to Software Project Management & Quality Assurance : By Ince, Dorrel,

   Helen Sharp & Mark Woodman

4. Software Engineering – Ian Sommerville, Addison Wesley, 2004

5. Foundations of Software Testing - Aditya P Mathur, Pearson Education, 2008.

6. Software Testing and Analysis Process Principles and Techniques – Mauro Pezze, Michal Young, Wiley India, 2008.

7. Software Testing Principles and Practices - Srinivasan Desikan, Gopalaswamy Ramesh, 2nd Edition, Pearson, 2007.

8. Software Testing - Ron Patton, 2nd edition, Pearson, 2004.

9. The Craft of Software Testing - Brian Marrick, Pearson, 1995.

Practical (605)