

Solapur University, Solapur

M.Sc. (Computer Science)

Syllabus (Semester – I and II)

(Choice Based Credit System)

With Effect from June 2016

Solapur University, Solapur
M.Sc. (Computer Science)

1. Introduction: A broad introduction of computer science is provided, including the key technologies and skills needed for employment. Student can explore his / her personal interests through a variety of optional modules. Advanced intellectual, teamwork, communication and other transferable skills are developed. These students are expected to lead new generation of computer scientist. The students would be true knowledge workers prestigious to the Nation.

2. Eligibility: The candidate passing any of the under graduate degree, namely, B.Sc.(Computer Science), B.Sc. (Entire Computer Science)., B.Sc. (Computer Technology), B.Sc. (Mathematics), B.Sc.(Statistics), B.Sc. (Electronics) will be eligible for admission to M.Sc. Computer Science.

3. Intake capacity of Students: 20 / 30

4. Admission / Selection Procedure: A student shall be held eligible for admission to the M. Sc. (Computer Science) course provided he / she has passed the B.Sc. examination in the subjects mentioned in Eligibility, and has passed the entrance examination conducted by the University. The students with B.Sc. from other universities shall be eligible if they qualify through entrance examination and they score minimum 55 percent B+ marks in the subject at the B.Sc. examination. While preparing the merit list for M. Sc. (Computer Science) admission, the performance at B.Sc. III and the performance at the entrance examination will be given equal weightage (50:50)

5. Duration of the Course: The M.Sc. is offered on full time basis, the course is of two years duration named as M.Sc. (Computer Science), each year is divided into two semesters for the convenience of teaching and examination. In each semester there will be teaching for 14 weeks followed by end of semester examination.

6. Fees Structure: The tuition fees or laboratory fees and other fees have to be paid at the beginning of every semester. At present a student has to pay tuition fees Rs. 4000/- per semester, laboratory fee Rs. 6000/- per semester and laboratory deposit of Rs. 500/- together with other fees. These fees may be revised from time to time. The fees once paid will not be refunded.

7. Structure of the Syllabus – M.Sc. (Computer Science):

Part – I Semester-I

Paper Code	Title of the Paper	Hrs / week	Distribution of Marks for Examination			Credits
			Internal	University	Total	
Hard Core - Theory						
HCT 1.1	DBMS	04	30	70	100	04
HCT 1.2	Data Structures	04	30	70	100	04
HCT 1.3	Object Oriented Programming using C++	04	30	70	100	04
Soft Core – Theory (Any One)						
SCT 1.1	Software Engineering	04	30	70	100	04
SCT 1.2	Operating System	04				
Hard core Lab / Project						
HCP 1.1	Practical based on HCT 1.1	04	15	35	50	02
HCP 1.2	Practical based on HCT 1.2	04	15	35	50	02
HCP 1.3	Practical based on HCT 1.3	04	15	35	50	02
HCP 1.4	Project – I	02	15	35	50	02
	Tutorial	01	-	-	25	01
Total		-	180	420	625	25

Part – I Semester-II

Paper Code	Title of the Paper	Hrs / week	Distribution of Marks for Examination			Credits
			Internal	University	Total	
Hard Core – Theory						
HCT 2.1	Java Programming	04	30	70	100	04
HCT 2.2	Computer Communication Network	04	30	70	100	04
Soft Core – Theory (Any One)						
SCT 2.1	UML	04	30	70	100	04
SCT 2.2	Software Testing	04				
Open Elective (Any One)						
OET 2.1	Office Automation	04	30	70	100	04
OET 2.2	Linux Operating System	04				
Hard core Lab / Project						
HCP 2.1	Practical based on HCT 2.1	04	15	35	50	02
HCP 2.2	Practical based on HCT 2.2	04	15	35	50	02
HCP 2.3	Project – II	02	15	35	50	02
Open Elective (Any One)						
OEP 2.1	Practical Based on OET 2.1	02	15	35	50	02
OEP 2.2	Practical Based on OET 2.2	02				
	Tutorial	01	-	-	25	01
Total		-	180	420	625	25

8. Passing Standard: Passing standard is same as that of other M.Sc. courses in the Solapur University. The candidate has to appear for internal evaluation of 30 marks and external evaluation (university exam) for 70 marks for each paper / practical / project. In case of theory papers internal examination/s will be conducted by the school / department. The nature of internal evaluation of practical and project will be decided by the respective schools / departments. The internal evaluation is a process of continuous assessment.

A student who failed in Term End examination (theory) & passed in Internal assessment of a paper (subject) shall be given FC (Failed in Term End Exam) Grade. Such student will have to appear for Term End examination only. A student who fails in Internal assessment and passed in Term End examination (Theory) shall be given FR (Failed in Internal Assessment) Grade. Such student will have to appear for Term End examination as well as internal assessment.

In case of year down candidates from the mark scheme the candidates shall appear for the same 70 marks paper of the external examination and his performance shall be scaled to 100 marks.

9. Nature of theory question paper

- 1) Duration of each theory paper is 2 hours and 30 minutes.
- 2) Each paper contains 7 questions each carrying 14 marks.
- 3) Students have to attempt five questions.
- 4) Question No.1 is compulsory and contains 14 objective type sub-questions each carrying 1 mark.
- 5) Question No.2 is compulsory and contains 3 short answer / short note type sub-questions each carrying 5 or 4 marks.
- 6) Students have to attempt any 03 questions from Question No. 3 to Question No. 7.
- 7) Question No. 3 to Question No. 7 contains 2 sub-questions.

M.Sc. (Computer Science) – Part – I
SEMESTER - I

HCT 1.1: DBMS

Unit – I

Introduction to Database Systems: Database – Definition, Limitations of traditional file processing systems, Advantages of DBMS, Users of DBMS. [02]

Database Architecture and Environment: Components of DBMS, Architecture, Physical, logical and view, DDL, DML, DCL, schemas, life cycle of Database System Development, Functions of DBMS. [05]

Conceptual Database Modelling: Data Model – Concept, types of data models, ER model, concepts of entity, entity set, attributes, domains, existence dependency, Keys: candidate, primary, composite, strong and weak entities, cardinality, specialization, generalization, aggregation, Relational Algebra, Relational Calculus. [08]

Unit – II

Relational Database Systems: Characteristics, relation, attribute, tuple, domain, null, Normalization, Functional Dependencies, Multivalued Dependencies, 1NF, 2NF, 3NF, 4NF, 5NF Boyce codd's normal form. [07]

SQL and PL/SQL: DDL, DML, DCL, Select: From, Where, Order by, Group by, Having, Intersect, Union, Distinct, Between, In, Between, Different types of functions, Delete, Update, Insert, Nested queries, joins, create, alter and drop, constrains, index, views, Triggers, Grant, Revoke, Commit, RollBack, Savepoint, PL/SQL: %Type, %Rowtype, Exception, Cursor etc. [08]

Unit – III

Transaction Management and Concurrency Control: Transaction – properties (ACID), states, Concurrency – control, locks, two phase locking serialization. [08]

Distributed Databases: Standalone v/s Distributed databases, Replication, Fragmentation, Client/Server architecture, types of distributed databases. [07]

Unit – IV

Database Recovery: Need for recovery, techniques – log based recovery, check point, differed and immediate updates, shadowing, Catastrophic and non-catastrophic failures, Recovery in multi-database environments, Two phase commit protocol. [06]

Query Processing: Steps in query processing, advantages of optimization. [03]

Object – Relational Databases: Abstract Datatypes, Nested Tables, Varying Arrays, Large Objects, Naming Conventions for Objects. [06]

Reference Books:

1. Database System Concepts by Korth: Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill Higher Education, 2006.
2. Ramez Elmasri, Shamkant Navathe, Pearson Education India, 2011.
3. An Intro. to Database Systems: C. J. Date, Pearson Education India.
4. Oracle 8i – The Complete Reference: Kevin Loney, George Koch, Osborne/McGraw-Hill, 2000.

HCT 1.2: Data Structures

Unit – I

Fundamental notions: Primitives and composite data types, choice of data structure and complexity of an algorithm. [04]

Arrays: Single and Multidimensional Arrays, sparse matrices. [04]

Stacks: Processing the stacks, Linked list implementation, Application of Stacks for expression solving, Non recursive implementation of recursive algorithms. [07]

Unit – II

Queues: Processing the queues, Linked list implementation, Dequeues, Priority queues and their applications. [06]

Linked List: Processing linked list, Circularly linked list, Doubly linked list, Multilinked lists, String and characters manipulation using arrays and linked list. [09]

Unit – III

Trees: Representation of hierarchical relationships, Tree processing, Binary trees, linked list implementation, traversal algorithms, Graph theoretic solutions and tree traversals, Binary trees, Threaded binary trees, Height balanced trees, General Trees. [08]

Design and analysis of algorithm for the implementation: Greedy methods, Dynamic programming, Backtracking, Branch and bound. [07]

Unit – IV

Sorting and searching: Various sorts viz. Insertion, Bubble sort, Selection sort, Quick sort, Merge sort, Radix / Bucket sort, Counting sort, searching algorithms and their complexities, . Binary tree indexing, B-tree indexing, Hash indexing. [15]

Reference Books:

1. Data structures and algorithms: Alfred Aho, John Hopcraft and Jeffrey Ullman, Addison – Wesley.
2. Introduction to data structures: Bhagat Singh and Thomas Nap, West Publishing Company.
3. The C Programming Language: Brian W. Kernighan, Dennis M. Ritchie, Prentice Hall, 1988.
4. Introduction to Data Structures with applications: J. P. Tremble, Tata McGraw Hill, 1984.
5. Data and file structures: Weiderberg.

HCT 1.3: Object Oriented Programming using C++

Unit – I

Overview Of C++: Object Oriented Programming, Introducing C++ Classes, Concepts of Object Oriented Programming, C++ as a superset of C, New style comments, main function in C++, meaning of empty argument list, function prototyping, default arguments and argument matching, User defined data types: enumerated types, use of tag names, anonymous unions, scope of tag names. [04]

Classes & Objects: Classes, Structure & Classes, Union & Classes, Inline Function, Scope Resolution operator, Static Class Members: Static Data Member, Static Member Function, Passing Objects to Function, Returning Objects, Object Assignment. Friend Function, Friend Classes. [05]

Array, Pointers References & The Dynamic Allocation Operators: Array of Objects, Pointers to Object, Type Checking C++ Pointers, The This Pointer, Pointer to Derived Types, Pointer to Class Members, References: Reference Parameter, call by reference and return by reference Passing References to Objects, Returning Reference, Independent Reference, C++'S Dynamic Allocation Operators, Initializing Allocated Memory, Allocating Array, Allocating Objects. [06]

Unit – II

Constructor & Destructor: Introduction, Constructor, access specifiers for constructors, and instantiation, Parameterized Constructor, Multiple Constructor in A Class, Constructor with Default Argument, Copy Constructor, Destructor. [07]

Overloading as polymorphism: Function & Operator Overloading: Function Overloading, Overloading Constructor Function Finding the Address of an Overloaded Function, Operator Overloading: Creating A Member Operator Function, Creating Prefix & Postfix Forms of the Increment & Decrement Operation, Overloading The Shorthand Operation (I.E. +=,-= Etc), Operator Overloading Restrictions, Operator Overloading Using Friend Function, Overloading New & Delete, Overloading Some Special Operators, Overloading [], (), -, Comma Operator, Overloading << And . [08]

Unit – III

Inheritance: Base Class Access Control, Inheritance & Protected Members, Protected Base Class Inheritance, Inheriting Multiple Base Classes, Constructors, Destructors & Inheritance, When Constructor & Destructor Function are Executed, Passing Parameters to Base Class Constructors, Granting Access, Virtual Base Classes. [08]

Virtual Functions & Polymorphism: Virtual Function, Pure Virtual Functions, Early Vs. Late Binding. [03]

Exception handling in C++: try, throw, catch sequence, multiple catch blocks, uncaught exceptions, catch-all exception handler. [04]

Unit – IV

Templates: Reason for templates compactness and flexibility, function template examples explicit specialization, class templates, out of class definition of member functions. [07]

The C++ I/O System Basics: C++ Streams, The Basic Stream Classes C++ Predefined Streams, Formatted I/O: Formatting Using the IOS Members, Setting The Format Flags, Clearing Format Flags, An Overloaded Form Of Setf (), Using Width() Precision() and Fill(), Using Manipulators to Format I/O, Creating Your own Manipulators. [08]

Reference Books:

1. C++: The Complete Reference: Herbert Schildt, Tata McGraw Hill.
2. Object Oriented Programming with C++: E. Balguruswami, Tata McGraw Hill.
3. Programming with C++ made simple: M. Kumar, Tata McGraw Hill.

SCT 1.1: Software Engineering

Unit – I

Introduction: Product and Process: Evolving role of software, software characteristic and components, crisis, myths, software engineering – a layered technology, software process, linear sequential model, prototyping model, RAD model, evolutionary software process model. [10]

Software Process And Project Metrics: Measures, metric indicators, metric in process and the project domains, software measurement, metrics for software quality, software quality assurance. [05]

Unit – II

Analysis Concepts And Principles: Requirement analysis, communication techniques, analysis principles, software prototyping & Specification. [07]

Analysis Modeling: Elements of the analysis model, data modeling, functional modeling, behavioral modeling, the mechanics of structured analysis, data dictionary, other classical analysis methods. [08]

Unit – III

Design Concepts & Principles: Software Design and software Engineering design process, Design principles, Design concepts, Design methods-Data design, Architectural design and process, Transform and Transaction mappings, Design post processing, Architectural design optimization, Interface design, Procedural design. [15]

Unit – IV

Software Testing Methods: Fundamentals, Test case design, White box testing, basis path testing, control structure testing, black box testing, Software testing strategies. [08]

Object Oriented Software Engineering: Object oriented concepts, identifying the elements of an object model, Management of object-oriented software projects, Object-oriented analysis, design and testing. [07]

Reference Books:

1. Software Engineering: Roger S. Pressman, McGraw Hill, 1997.
2. Software Engineering: Shooman, McGraw Hill, 1987.
3. Software Engineering: Ian Sommerville, Addison Wesley, 1985.
4. Object Oriented Analysis and Design: Grady Booch, Pearson.
5. Object Oriented Modeling and Design: James Rumbaugh, Michael Bluha, Prentice Hall India, 1991.
6. Fundamentals of Software Engineering: Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli, Prentice Hall India, 2003.

SCT 1.2: Operating System

UNIT-I

Introduction and structure of Operating System: Concept of multi – programming, Parallel, Distributed and real – time – sharing, Operating system structure - Operating system components and Services System Call System.

[15]

UNIT-II

Process Management, Synchronization and Deadlocks: Process Concept, process scheduling, cooperating process, Threads, inter process communication, CPU scheduling Criteria, scheduling algorithms-FCFS, SJF, Priority, Round Robin, Multilevel feedback queue scheduling.

Process Synchronization and Deadlocks: Critical Section problem, Synchronization hardware, Semaphores, Critical region, Monitors, Deadlock system model, characterization of deadlocks and deadlock Prevention, Avoidance and detection, recovery from deadlock.

[15]

UNIT-III

Memory Management: Memory Management, Logical and physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation.

Virtual, memory: demand paging and its performance, page replacement algorithm, allocation of frames, thrashing.

[15]

UNIT-IV

File System: Secondary Storage Structure File Concept Access method, Directory Structure, Protection and consistency Semantics, File System Structure, Allocation Method, Free space Management, Directory implementation, Disk Structure, Disk Scheduling methods, Disk Management, Swap space Management.

Security and protection: goals of protection domain of protection, access matrix, security program threats, system threats.

CASE Study: Network Operating System, OS Environment, Comparison of Distributed Operating System, Multiprocessor Time Sharing Systems and Network Operating System.

[15]

Reference Books:

1. Operating System Principles: Abraham Silberschatz, Peter Galvin, Greg Gagne, 7th ed., Wiley Student Edition.
2. Operating System: Bawn.
3. Modern Operating Systems: Andrew S. Tanenbaum, Prentice Hall India.
4. Operating Systems: Stuart E. Madnick, John J. Donovan, McGraw-Hill, 1974.
5. Operating system: Peterson.

**M.Sc. (Computer Science) – Part – I
SEMESTER II**

HCT 2.1: Java Programming

Unit – I

Introduction to Java: Importance and features of java, keywords, constants, variables and data types, Operators and expressions, Decision making, branching and looping: if..else, switch, ?: operator, while, do, for statements, labeled loops, jump statements: break, continue, return. [06]

Classes and Objects: defining a class, adding variables and methods, creating objects, constructors, class inheritance. [04]

Arrays and strings: creating an array, one and two dimensional arrays, string array and methods, String and StringBuffer classes, Wrapper classes. [05]

Unit – II

Inheritance: Basics types, using super, Multilevel hierarchy abstract and final classes, Object class, Packages and interfaces, Access protection, Extending Interfaces, packages. [05]

Exception Handling: Fundamentals, exception types, uncaught exceptions, throw, final, built in exception, creating your own exceptions. [04]

Multithreaded Programming: Fundamentals of Java thread model, priorities, synchronization, messaging, thread class, Runnable interface, interthread Communication, suspending, resuming and stopping threads. [06]

Unit – III

Event Handling: Event Model, Event Classes, Event Listener Interfaces, Adapter and Inner Classes, Working with windows, graphics and text, using AWT controls, Layout managers and menus, handling Image, animation, sound and video, Java Applet. [15]

Unit – IV

Input/Output: Basics, Streams, Byte and Character stream, predefined streams, Reading and writing from console and files. Using Standard Java Packages (lang, util, io, net). [08]

JDBC: JDBC API, JDBC Drivers, Products, JDBC Design considerations, Basic steps to JDBC, setting up a connection to database, Creating and executing SQL statements. [07]

Reference Books:

1. Java 2: The Complete Reference: The Complete Reference, Patrick Naughton, Herbert Schildt, McGraw Hill Professional, 1999.
2. Programming with JAVA - A Primer: E. Balaguruswamy, 3rd Edition, McGraw Hill.
3. Computing Concepts with Java 2 Essentials: Cay Horstmann, John Wiley.
4. An Introduction to Programming Using Java: Rick Decker, Stuart Hirshfield, 2000.

HCT 2.2: Computer Communication Network

Unit – I

Introduction: Uses of Computer networks: Business Applications, Home Applications, Mobile Users, Social Issues; Network Hardware: Local Area Networks, Metropolitan Networks, Wide Area Networks, Wireless Networks, Home Networks, Internetworks; Network Software: Protocol Hierarchies, Design Issues for the Layers, Connection-Oriented and Connectionless Service Primitives, Relationship of Services to Protocols; Example of Networks: The Internet, The ARPANET, NSFNET, Internet usage, Architecture of the internet.

[07]

Data Link Layer: Data Link Layer Design Issues: Services Provided to the Network Layer, Framing, Error Control, Flow Control; Error Detection and Correction: Error-Correcting Codes, Error-Detecting Codes; Elementary Data Link Protocols: An Unrestricted Simplex Protocol, A Simplex Stop-and-Wait Protocol, A Simplex Protocol for a Noisy Channel; Sliding Window Protocols: A One-Bit Sliding Window Protocol, A Protocol Using Go Back N, A Protocol Using Selective Repeat; Example Data Link Protocols: HDLC—High-Level Data Link Control, The Data Link Layer in the Internet.

[08]

Unit – II

Network Layer: Network Layer Design issues: Store and Forward packet Switching, Services Provided to the Transport Layer, implementation of Connectionless Service, Implementation of Connection-oriented Services, Comparison of Virtual Circuit and Datagram subnets; Routing algorithms: The Optimality Principle, Shortest Path Routing, Flooding, Distance Vector Routing, Link state Routing, Hierarchical Routing, Broadcast Routing, Routing for Mobile Hosts; Congestion Control Algorithms: General Principles of Congestion Control, Congestion Prevention Policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram Subnet, Load Shedding, Jitter Control; Quality of Service: Requirements, Techniques for Achieving Good Quality of Service; Internetworking: Differences in Networks, Network Connection, Concatenated Virtual Circuits, Connectionless Internetworking; Tunneling; Internetwork Routing, Fragmentation; The Network Layer in the Internet: The IP Protocol, IP Addresses, Internet Control Protocols, Mobile IP; IPV6.

[15]

Unit – III

The Transport Layer: The Transport Service: Services Provided to the Upper Layers, Transport Service Primitives, Berkeley Sockets; Elements of Transport Protocols: Addressing, Connection Establishment, Connection Release Flow Control and Buffering, Multiplexing, Crash Recovery; The Internet Transport Protocol – UDP: Introduction to UDP, Remote Procedure Call, The Real-Time Transport Protocol; The Internet Transport Protocols – TCP: Introduction to TCP, The TCP Service Model, The TCP Protocol, The TCP Segment Header, TCP Connection Establishment, TCP Connection Release, Modeling TCP Connection Management TCP Transmission Policy, TCP Congestion Control, Wireless TCP and UDP.

[15]

Unit – IV

The Application Layer: DNS – The Domain Name System: The DNS Name Space, Resource Records, Name Servers; Electronic Mail: Architecture and

Services, The User Agent, Message Formats, Message Transfer, Final Delivery; The World Wide Web: Architectural Overview, Static Web Documents, Dynamic Web Documents, HTTP, Performance Enhancements, The Wireless Web. [15]

Reference Books:

1. Computer Networks: Andrew S. Tanenbaum, 4th Edition, Pearson Education, Asia, 2002.
2. Communication Networks: Fundamental Concepts and Key Architectures, Alberto Leon-Garcia, Indra Widjaja, Tata McGraw Hill, 2006.
3. Data Communications and Networking: Behrouz A. Forouzan, Tata McGraw Hill, Second Edition, 2001.

SCT 2.1: UML

Unit – I

Object Oriented Design and Modeling: Object Oriented Fundamentals, Objects and object classes, object oriented design process, importance of modeling, principles of modeling, object oriented modeling. [07]

Introduction to UML: Conceptual model of UML, building blocks of UML, Mechanisms in UML, architecture, software development life cycle. [08]

Unit – II

Basic Structural Modeling: Classes, relationships, common mechanisms, class and object diagrams. [08]

Advanced structural Modeling: Advanced classes, advanced relationships, Interfaces types and roles, packages, instances and object diagrams. [07]

Unit – III

Collaboration Diagrams and Sequence Diagrams: Terms, concepts and depicting a message in collaboration diagrams. Terms and concepts in sequence diagrams, Difference between collaboration and sequence diagram Depicting synchronous messages with / without priority call back mechanism. [08]

Basic behavioral modeling: Interactions use cases, Use Case Diagrams, Interaction Diagrams and activity diagrams. [07]

Unit – IV

Advanced behavioral modeling: Events and signals, state machines, process and threads, time and space, state chart diagrams. [08]

Architectural Modeling: Terms, Concepts, examples, Modeling techniques for component diagrams and deployment diagrams. [07]

Reference Books:

1. The Unified Modelling Language User Guide: Grandy Booch, James Rumbaugh, Ivar Jacobson, Pearson Education 2002.
2. Software Engineering Sixth Edition: Ian Sommerville, Pearson Education, 2003.
3. Fundamentals of Object-oriented Design in UML: Meilir Page-Jones, Larry L. Constantine, Addison Wesley, 2000.

SCT 2.2: Software Testing

Unit – I

Principles of Testing: Context of Testing in Producing Software, The Incomplete Car, Dijkstra's Doctrine, Test the Tests First, Automation Syndrome.

Software Development Life Cycle Models: Phases of Software Project, Quality, Quality Assurance, and Quality Control, Testing, Verification, and Validation, Process Model to Represent Different Phases, Life Cycle Models.[15]

Unit - II

Types of Testing: White Box Testing, Static Testing, Structural Testing, Challenges in White Box Testing.

Black Box Testing: What is Black Box Testing? Why Black Box Testing? When to do Black Box Testing? How to do Black Box Testing?

Integration Testing: Integration Testing as a Type of Testing, Integration Testing as a Phase of Testing, Scenario Testing, Defect Bash.

System and Acceptance Testing: System Testing Overview, Why is System Testing Done?

Functional Versus Non-Functional Testing: Functional System Testing, Non-Functional Testing, Acceptance Testing. [15]

Unit - III

Performance Testing: Introduction, Factors Governing Performance Testing, Methodology for Performance Testing, Tools for Performance Testing, Process for Performance Testing.

Regression Testing: Types of Regression Testing, How to do Regression Testing?

Internationalization (I18n) Testing: Primer on Internationalization, Test Phases for Internationalization Testing, Enabling Testing, Locale Testing, Internationalization Validation, Tools Used for Internationalization. [15]

Unit - IV

Testing of Object-Oriented Systems: Primer on Object-Oriented Software, Differences in OO Testing.

Usability and Accessibility Testing: Approach to Usability, When to do Usability Testing? How to Achieve Usability? Accessibility Testing – Basic Accessibility, Product Accessibility.

Software Test Automation: Skills Needed for Automation, What to Automate, Scope of Automation, Design and Architecture for Automation.

Test Metrics and Measurements: What are Metrics and Measurements? Why Metrics in Testing? Types of Metrics, Project Metrics. [15]

Reference Books:

1. Software Testing: Principles and Practices: Gopaldaswamy Ramesh, Srinivasan Desikan, Pearson India, 2007.
2. A Practitioner's Guide to Software Design: Lee Copeland, Artech House Publishers, 2003.
3. The Art of Software Testing: Glenford Myers and Corey Sandler, 2nd Edn., John Wiley and Sons, 2004.
4. Software Testing Techniques: Boris Belzer, Van Nostrand Reinhold 2nd Edition, 1990.

OET 2.1: Office Automation

UNIT – I

[15]

Introduction to Computer: Applications of Computer – Advantages of Computer – Terms related to Computer - Characteristics of Computer: Speed, Storage, Versatility and Diligence – Hardware & Software.

Windows: Desktop icons and their functions: My computer, My documents, Network neighborhood, Recycle Bin, Quick launch tool bar, System tray, Start menu, Task bar, Dialog Boxes: List Box, Spin Control Box, Slide, Drop-down list, Radio button, Check box, Text box, Task Bar - System Tray - Quick launch tool bar - Start button - Parts of Windows -Title bar-Menu bar - Scroll bar-Status bar, Maximize, Minimize, close and Resize & Moving a Window, Keyboard Accelerators: Key board short keys or hotkeys.

UNIT – II

[15]

MS Word: Working with Documents -Opening & Saving files, Editing text documents, Inserting, Deleting, Cut, Copy, Paste, Undo, Redo, Find, Search, Replace, Formatting page & setting Margins, Converting files to different formats, Importing & Exporting documents, Sending files to others, Using Tool bars, Ruler, Using Icons, using help.

Formatting Documents: Setting Font styles, Font selection- style, size, colour etc, Type face - Bold, Italic, Underline, Case settings, Highlighting, Special symbols, Setting Paragraph style, Alignments, Indents, Line Space, Margins, Bullets & Numbering.

Setting Page style: Formatting Page, Page tab, Margins, Layout settings, Paper tray, Border & Shading, Columns, Header & footer, Setting Footnotes & end notes – Shortcut Keys; Inserting manual page break, Column break and line break, Creating sections & frames, Anchoring & Wrapping, Setting Document styles, Table of Contents, Index, Page Numbering, date & Time, Author etc., Creating Master Documents, Web page.

Creating Tables: Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting, Sorting, and Formula.

Drawing: - Inserting Clip Arts, Pictures/Files etc.

Tools: Word Completion, Spell Checks, Mail merge, Templates, Creating contents for books, Creating Letter/Faxes, Creating Web pages, Using Wizards, Tracking Changes, Security, Digital Signature. Printing Documents – Shortcut keys.

UNIT – III

[15]

MS Excel: Spread Sheet & its Applications, Opening Spreadsheet, Menus - main menu, Formula Editing, Formatting, Toolbars, Using Icons, Using help, Shortcuts, Spreadsheet types. Working with Spreadsheets- opening, Saving files, setting Margins, Converting files to different formats (importing, exporting, sending files to others), Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys.

Entering & Deleting Data: Entering data, Cut, Copy, Paste, Undo, Redo, Filling Continuous rows, columns, Highlighting values, Find, Search & replace,

Inserting Data, Insert Cells, Column, rows & sheets, Symbols, Data from external files, Frames, Clipart, Pictures, Files etc, Inserting Functions, Manual breaks.

Setting Formula: finding total in a column or row, Mathematical operations (Addition, Subtraction, Multiplication, Division, Exponentiation), using other Formulae.

Formatting Spreadsheets: Labelling columns & rows, Formatting- Cell, row, column & Sheet, Category - Alignment, Font, Border & Shading, Hiding/ Locking Cells, Anchoring objects, Formatting layout for Graphics, Clipart etc., Worksheet Row & Column Headers, Sheet Name, Row height & Column width, Visibility - Row, Column, Sheet, Security, Sheet Formatting & style, Sheet background, Colour etc, Borders & Shading – Shortcut keys.

Working with sheets: Sorting, Filtering, Validation, Consolidation, and Subtotal.

Creating Charts: Drawing. Printing. Using Tools – Error checking, Formula Auditing, Creating & Using Templates, Pivot Tables, Tracking Changes, Security, Customization.

UNIT-IV

[15]

MS Power point: Presentation – Opening new presentation, Different presentation templates, setting backgrounds, selecting presentation layouts.

Creating a presentation: Setting Presentation style, Adding text to the Presentation.

Formatting a Presentation: Adding style, Colour, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout. Adding Graphics to the Presentation- Inserting pictures, movies, tables etc into presentation, Drawing Pictures using draw.

Adding Effects to the Presentation: Setting Animation & transition effect. Printing Handouts, Generating Standalone Presentation viewer.

MS Access: Introduction, Planning a Database, Starting Access, Access Screen, Creating a New Database, Creating Tables, Working with Forms, Creating queries, Finding Information in Databases, Creating Reports, Types of Reports, Printing & Print Preview – Importing data from other databases viz. MS Excel etc.

Reference Books:

1. Information Technology in Business: Principles, Practices, and Opportunities by James A Senn, Prentice Hall.
2. Technology and Procedures for Administrative Professionals by Patsy Fulton-Calkins, Thomson Learning.
3. Computer Fundamental MS Office – Including Internet & Web Technology: Anupama Jain (Author), Avneet Mehra
4. The Complete Reference: Virginia Andersen, McGraw Hill
5. MS Office 2007 in a Nutshell: S. Saxena, Vikas Publications
6. MS-Office 2007 Training Guide: S. Jain, BPB Publications
7. Learning Computer Fundamentals, MS Office and Internet & Web Technology: D. Maidasani.

OET 2.2: Linux Operating System

Unit – I

Introduction to RED Hat Linux: Advantages of Linux, Other Linux distributions, Red Hat Linux Installation, Concept of Linux loader, Hardware Requirements.

Working with Linux: Linux file system, Shells, Text editors, Changing User Information, File Permissions, Virtual Consoles. [15]

Unit – II

The X Window System: Basic X window system, Configuring X window systems, Starting X, Selecting & using X window.

Managing Services: Linux Boot Process, System services and run levels, Controlling services at boot with administrative tools, Starting and stopping services manually. [15]

Unit – III

Managing Software & System Resources: Using RPM for software management, Using RPM on the command line, Extracting a single file from & RPM file, Graphical Package Management, System monitoring tools.

Printing with Linux: Configuring & managing print services, Local printer installation, Network printer installation, Linux printing commands, Using the Common UNIX Printing System (CUPS), Console print control. [15]

Unit – IV

Network Connectivity: Networking with TCP/IP, Hardware devices for networking, Using RED HAT Linux network configuration tools, Using DHCP [Dynamic Host, Configuration Protocol, Using the network file system, Wireless networking.

Introduction to DNS & Samba: Introduction to DNS, Essential DNS concepts, Configuring namespaces with DNS, Installing Samba, Configuring Samba, Running the Samba Server. [15]

Reference Books:

1. Red Hat Linux 6 Unleashed: David Pitts, Bill Ball, Sams, 1999
2. Red Hat Fedora 4 Unleashed: Paul Hudson, Andrew Hudson, Bill Ball, Hoyt Duff, Sams, 2000.

Chairman
Ad hoc BOS in Computer Science