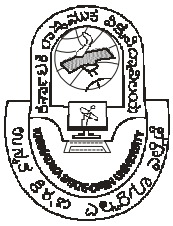

Karnataka State Open University

Mysore,Karnataka – 570006

In Association with BSAITM

Syllabus
For
Bachelor of Information Technology (BSC-IT)

Detailed Syllabus

Semester – I		
CODE	SUBJECT	CREDITS
BSIT11	Computer System and Peripherals	8
BSIT12	Operating Systems I	8
BSIT13	Office Automation	8
BSIT13-L	Office Automation (Lab)	2
BSIT14	Database Management Syatem (DBMS) I	8
BSIT14-L	Database Management System (DBMS) I (Lab)	2
BSIT15	Basics of Internet and HTML	8
BSIT15-L	Basics of Internet and HTML (Lab)	2
TOTAL CREDITS		40

Semester – II		
CODE	SUBJECT	CREDITS
BSIT21	C Programming Language	8
BSIT21-L	C Programming Language (Lab)	2
BSIT23	DBMS II	16
BSIT23-L	DBMS II (Lab)	2
BSIT22	Operating Systems II	8
BSIT24	Fundamentals of Information Technology	8
TOTAL CREDITS		40

Semester – III		
CODE	SUBJECT	CREDITS
BSIT31	Computer Organization and Architect	10
BSIT32	Data Structures using C	10
BSIT32-L	Data Structures using C (Lab)	1
BSIT33	Data Communication	10
BSIT34	Object Oriented Programming (OOP) with C ++	10
BSIT34-L	Object Oriented Programming (OOP) with C++ (Lab)	1
TOTAL CREDITS		40

Semester – III		
CODE	SUBJECT	CREDITS
BSIT41	Fundamentals of Computer Graphics	10
BSIT41-L	Fubdamentals of Computer Graphics (Lab)	1
BSIT42	Computer Network	15
BSIT43	Java Script, Multimedia and Web Design	15
BSIT43-L	Java Script, Multimedia and Web Design (Lab)	1
BSIT44	DBMS III	
TOTAL CREDITS		40

Semester – V		
CODE	SUBJECT	CREDITS
BSIT51	Software Engineering	10
BSIT52	Algorithms	10
BSIT52-L	Algorithms (Lab)	2
BSIT53	Java	10
BSIT53-L	Java (Lab)	2
BSIT54	Network Programming	10
TOTAL CREDITS		40

Semester – VI		
CODE	SUBJECT	CREDITS
BSIT61	Unix Systems Programming	3
BSIT61-L	Unix Systems Programming (Lab)	2
BSIT62	Visual Basic (including ASP)	3
BSIT62-L	Visual Basic (including ASP) (Lab)	2
BSIT63	Software Quality & Testing	3
BSIT64	Project	3
TOTAL CREDITS		16

Detailed Syllabus

B.Sc.IT-11 : Computer System and Peripherals

Unit 1 : Introduction to Computers Definition and organization of a computer, History and Evolution of Computers, Different Types of Computer, Functional Units of Computers, Logical units of a computer, Functional units of a computer, CPU (Central Processing Unit), MU (Memory Unit), I/OU Input / Output Unit , Secondary Storage

Unit 2 : Number System and Data Representation Different number systems, Decimal number system, Binary number system, Octal number system, Hexadecimal number system, Floating point representation, Character representation, Operating Systems

UNIT 3: Operating System Concepts, Roles of Operating System, Operating System as Interpreter or Translator Operating System as Resource Manager.

UNIT 4: Elements of Information Technology Range of IT Applications, Multimedia, The Internet, Intranets and Extranets, Intelligent Systems, Expert Systems, Virtual Reality, Data, Information and Information System, Introduction Data, Information
Information System.

Unit 5: Basic Components of Computer Components of Computer, Motherboard, Input Devices, Output Devices, Storage Devices, Cards, Ports and Cords, Power Supply.

UNIT 6: Classification of Computers, Classification according to Purpose, Classification according to Components, Classification according to Size, Application Software, Application Programs
General Purpose Application Packages, Spreadsheets, DBMS, DTP.

Unit 7: Programming Languages, Classification and Types Machine Language, Assembly Language, High Level Language, Fourth Generation Languages, Graphical User Interface, System Software, Assembler, Macro Language and Macro Processor, Loaders and Linkage Editors

UNIT 8: Compilers, Programming Language Grammar, Utilities Program, Word Processing, Spreadsheets and Databases, Word Processing, Spreadsheets, Database

Reference Books:

1. Introduction To Computers By Subramanian
2. Peter Norton's Introduction To Computers By Norton, Peter
4. Pc Software Made Simple By Taxali, Ravi Kant
5. Logic and Computer Design Fundamentals (4th Edition) by M. Morris Mano

B.Sc.IT-12 : Operating Systems

Unit 9: An overview of Operating System Introduction, History of computer operating systems, Mainframe systems, Desktop systems, Multiprocessor systems, Distributed systems, Clustered systems, Real Time system

Unit 10: System's components and Operating System Services Systems components, Process Management, Main-Memory Management, File Management, I/O System Management, Secondary-Storage Management, Networking, Protection System, Command Interpreter System, Operating System Services

Unit 11: System Calls and System Programs
Introduction, System calls, System Calls for Process Management, System Calls for Signaling, System Calls for File Management.

UNIT 12: System Calls for Directory Management, System Calls for Protection, System Calls for Time Management, System Calls for Device Management, System Programs

UNIT 13: Operating System Structure and Process Management Introduction, System Structure, Monolithic Systems, Layered Systems, Virtual Machines, Exokernel , Client-server Model.

UNIT 14: Process Management, Process Concept, Thread, Processes vs Threads, Benefits of Threads, Process state, Primary process states, Additional process states, Process Control Block, Process State Transitions, Process Scheduling-Types of Scheduling, Operations on process, CPU Scheduling, Deadlock

UNIT 15: Memory Management and Mass-Storage Structure
Introduction, Memory Management, Background, Binding of Instructions and Data to Memory, Dynamic Loading, Dynamic Linking, Overlays, Logical vs Physical Address Space, Memory-Management Unit (MMU), Monoprogramming, Multiprogramming, Memory Allocation, Virtual Memory

UNIT 16: Disk structure, Disk scheduling, Disk Management, Swap Space Management, File-System Interface, File System Implementation

Reference Books:

1. Operating Systems: Internals and Design Principles by Wiiliam Stallings
2. Operating Systems by Manick
3. Operating System Concepts by Abraham Silberschatz, Peter B. Galvin, and Greg Gagne
4. Modern Operating Systems (3rd Edition) by Andrew S. Tanenbaum
5. Understanding Operating Systems by Ann McHoes and Ida M. Flynn

B.Sc.IT-13: Office Automation

UNIT 17: Fundamentals of Computer Introduction – computer – Generations of computer – advantages & disadvantages, Types of computers - Personal computers (PC) – configuration of PC's –Specification.

UNIT 18: Basic components of computer system - control unit – input output unit – Memory – RAM – ROM, Software – System software – Application software – Hardware – Printer – scanners, Input & Output storage devices – Hard disk drives – Floppy drives – CD / DVD drives. Flash drives.

UNIT 19: Windows Operating System Introduction – Versions – File systems in win 98 and win xp – hardware requirement for windows, Control Panel – Add or remove programs – system setting – Device manager – Windows help, My computer – my documents – Accessories- MS Paint, calculator, note pad, word pad, Address book and system tools

UNIT 20: Installation of Windows – Right click properties of windows – Creating, removing, renaming files & folders- Installing system software – Playing movies & songs using media player – Copying and writing disc.

UNIT 21: MS-Word Introduction to computers – Hardware – Software, Operating System: Windows XP, MS-Paint, Notepad, Word pad, working with Menus – Shortcut keys, Introduction to MS-Word, Creating Editing and formatting Document – Working with Drawing objects – Text Manipulation – Word art, Clipart – Inserting symbols, Diagram – Applying effects to Auto shapes – Bullets & Numbering, Creating Columns – Plotting, editing and filling drawing objects – Bookmark- Header & Footer – Hyperlink – Applying backgrounds & Borders, Shading – Auto format- Working with tables – Sorting -Applying formula, Checking spelling and Grammar – Creating labels – Envelopes – Mail merge – Letter wizard.

UNIT 22: MS –Excel Introduction to Excel Features – Data Entry – Formatting cells & columns – plotting graphs –Workbook features – fill series, Functions – Applying formula to applications & Data sorting – Auto format, Data Validation – Conditional formatting - Data consolidation – Sub totals, Filters – Auto Filter - Pivot table & chart – Checking & correcting formula – Protecting workbook

UNIT 23: RDBMS & Internet Concepts Introduction to DBMS – Basic terminologies - Data Base – File – Table – Table Structure – Record (Tuples) – Attributes / Elements, Primary Key – Foreign Key – Candidate Key – Query – Forms – Macros Various Packages & Softwares for DBMS – Difference Between DBMS & RDBMS

UNIT 24: Introduction to SQL- Internet Concepts : Introduction – Browser – ISP – World Wide Web – Types of Internet Connection – URL – Protocols: HTTP, FTP, TCP/IP, SMTP- Search Engines – Downloading – Uploading Email – Web Applications – Messenger & Chatting – Scripting Languages – HTML.

Reference Books:

1. MS-Office, by Nellai Kannan.
2. Word 2003, 2004 by David Rivers,
3. Operating Systems by D.M.Dhamdhere

B.Sc.IT-14: Database Management Systems (DBMS) 1

Unit 25: Introduction to Databases Database and its Hierarchies, History of Databases, Types of DBMS

Unit 26: Database Environment Database and DBMS Software, Database Architectural, Three Layered Architectural/O Functions, Characteristics of Database Approach

UNIT 27: Relational Model and SQL: Data Manipulation, Data Definition Logical Data Models, Relational Data Model, Querying Relational Data, Relational Algebra.

UNIT 28: Relational Calculus, SQL Language, SQL Database Objects, SQL Data Types, DDL, DML and TCL Commands, Retrieving Data, Inserting Data, Updating Data, Deleting Data, Creating and Altering Tables, Views, Sequence, Index

UNIT 29: Database Planning, Design And Administration Database Application Life-cycle, Alternate System Development Methodologies, Database Planning

UNIT 30: System Definition, Requirements Collections and Analysis, Database Design, DBMS Selection, Application Design, Database Administration

UNIT 31: Entity Relationship Modeling, Normalization and Database Security Database Design, Entity, Attributes and Entity Sets, Relationships and Relationship Sets, ER Diagrams, Additional Features of ER Model, Conceptual Database Design with the ER Model, Anomalies in Databases, Redundancy, Inconsistency, Update Anomalies.

UNIT 32: Good Database Designing, First Normal Form (1NF), Second Normal Form (2NF), Third Normal Form (3NF), Boyce-Codd Normal Form, Fourth Normal Form (4NF), Access Control, Discretionary Access Control, Mandatory Access Control, Additional Issues to Security

Reference Books:

1. Database design for mere mortals. Hernandez
2. Database management by Watson
3. Database Management Systems by Raghu Ramakrishna and Johannes Gehrke
4. DBMS Magazine's Database Foundations Series by Joseph D. Booth
5. Clipper 5 Developers Guide (B/ (DBMS Magazine's Database Foundations Series) by Joseph D. Booth

B.Sc.IT-15: Basics of Internet and Html

UNIT 33: Introduction to HTML Introduction.
UNIT 34: information files creation, web sever, web client/ Brower, understanding how a Brower with a web sever, hyper text markup language,.
UNIT 35: html editors, html tags, the structure of an htmlprogram, document heads, document body
UNIT 36: Lists Introduction lists, types of lists, definition lists
UNIT 37: Graphics Introduction, adding graphics to the HTML documents
UNIT 38: Tables Introduction, the caption tag
UNIT 39: Linking Documents Introduction, links, external document reference, internal document reference.
UNIT 40: Images as hyperlinks, image maps, ISMAPS

Reference Books:

1. Basics of internet and html
2. Asp.net developer's jumpstart by pauld.sheriff,kengetz
3. Basic html teacher resourcesk.hayhow
4. Html and xhtml, the definitive guide by chuck musciano, Bill Kennedy

Semester- II

B.SC.IT 21 : C Programming Languages

UNIT 1: Origin and Introduction Programming languages About C, Evolution of C, Structure of a C Program, Compilers & Interpreters Compiling a C Program, Pseudo Codes, A Simple C Program.
UNIT 2: Data Types, Variables, Constants and Control Constructs Data Types Variables, Constants Operators, Type Modifiers and Expressions Operators Type Modifiers Expressions Type Definitions Using 'typedef',
UNIT 3: Introduction to Input/Output Console I/O Functions Unformatted Console I/O Functions, Control Statements, Conditional Statements, Loops in C The break Statement, The Continue Statement.
UNIT 4: Arrays and Functions Introduction to Arrays One Dimensional Array Strings Two Dimensional, Array Multi-dimensional Array
UNIT 5: Introduction to Functions, Function Declaration and Prototypes, Storage Classes Recursion in Function.
UNIT 6: Pointers Introduction to Pointers, Pointer Notation, Pointer Declaration and Initialization, Accessing Variable through Pointer, Pointer Expressions, Pointers and One Dimensional Arrays, Arrays of Pointers, Pointer to Pointers, Pointers and Functions.
UNIT 7: Structures, Unions, Linked List and File Handling in C Structure Definition, Structure Initialization, Arrays of Structures, Arrays within Structures, Structures within Structures, Passing Structures to Functions, Structure Pointers.
UNIT 8: Union–Definition and Declaration, Accessing a Union Member, Initialization of a Union Variable, Use of User Defined Type Declarations, Dynamic Memory Allocation, Linked List, Basic List Operations. What is a File, Defining and Opening a File, Functions for Random Access to Files?

Reference Books:

1. Programming in C By Stephen G. Kochan
2. Programming in C By M.T.Somashekara
3. Let Us C By Yashwant Kanitkar

B.SC.IT 22: Database Management System II
UNIT 9: Managing Data Introduction, Managing Data

UNIT 10: A Historical Perspective, File system versus DBMS

UNIT 11: Describing and storing data in a DBMS

UNIT 12: Advantages of DBMS, Queries in a DBMS

UNIT 13: Transaction Management

UNIT 14: Structure of a DBMS Database.

UNIT 15: Database Design and ER Diagrams Introduction

UNIT 16: Database design, Entity, Attributes and Entity Sets, Relationships and Relationship Set

UNIT 17: E-R Diagrams, Additional Features of ER Diagrams, Conceptual Database Design with the ER Model.

UNIT 18: Relational Models Introduction, Various Logical Data Models, Relational Data Model, Querying Relational Data, Relational Algebra, And Relational Calculus.

UNIT 19: SQL Introduction, Database Query Languages, Relational Database Query Languages, Query by Example (QBE).

UNIT 20: Structured Query Language (SQL), Benefits of SQL, Tables, Views, Indexes, SQL Command Syntax and Usage, Data Manipulation Language Commands, Transaction Control Commands ,Writing SQL Commands.

UNIT 21: Transaction Management Overview Introduction, ACID Properties, Transactions and schedules,

UNIT 22: Locking Techniques for Concurrency Control Dealing with Deadlock and Starvation

UNIT 23: Concurrency Control Based on Timestamp Ordering

UNIT 24: Multi-version Concurrency Control Techniques, Optimistic Concurrency Control, and Transaction support in SQL.

Reference Books:

1. Database Systems by Hector Garcia-Molina
2. Principles of Distributed Database Systems by M. Tamer Ozsu and Patrick Valduriez

B.SC IT 23 : OPERATING SYSTEMS II
UNIT 25: Basic Concepts of Operating System, Introduction

UNIT 26: Computer Hardware & OS Interaction

UNIT 27: Functions, Components, System Structure

UNIT 28: Process Scheduling Introduction, Threads

UNIT 29: Inter Process Communication, CPU Scheduling Criteria, CPU Scheduling Algorithms

UNIT 30: Process Synchronization, Introduction Process Synchronization, Concepts Critical Section Problems Synchronization Hardware Semaphores, Classical problems of synchronization Monitors

UNIT 31 Deadlock Introductions Basic Concepts of Deadlock Prevention Deadlock Avoidance and Detection Recovery from Deadlock

UNIT 32: Paging and Segmentation Introduction Paging and Segmentation

B.SC IT 24 Fundamental of Information Technology

Unit 33: Introduction to Computers ,characteristic of computers, evolution of computers, Generations, classification.

Unit 34: Applications of computers, number systems, conversions, Boolean algebra and logic gates, organization and architecture of modern computer systems and their structure and function.

Unit 35: Instruction fetch and execute cycle, memory hierarchy, primary memory -RAM, ROM, secondary memory, input and output devices.

Unit 36:Information Concepts and Processing, Definition of information, need for information, Value of information, categories and level of information in business organization, Data concepts and data processing, data representation, entropy.

Unit 37: Programming Language, Computer language, generation of languages, Introduction to 4 GLS, software development methodology, Life cycles, software coding, testing. Maintenance, industry standards, Introduction to ISO, SEI-CMM standards of IT industry.

Unit 38:Data Communication and Networks , Issues in data communication, need for data transmission over distance, types of data transmission, media for data transmission, networking of computers, introduction of LAN and WAN

Unit 39: Network topologies, basic concepts in computer networks, client server architecture, introduction to advanced communication techniques like ISDN,ATM, token based protocols CSMA/CD.

Unit 40: Internet Technology and Applications, Internet structure and components, TCP/IP communication protocol, gateways, routers, internet service providers, www, gopher, ftp, SMTP, PPP, e-commerce, data warehousing, HTML.Elementary concepts in object oriented programming, EDI, electronic payments, digital signatures, network security and firewall.

Reference Books:

1. Digital Computer Fundamentals, Bartee, Thomas TMH
2. Introduction to Digital Computer Design , Raja Raman, PHI
3. Introduction to Computers, Norton Peter, TMH
4. Inside IBM PC, Norton Peter, PHI
5. Introduction to Computer Science, Mata Toledo, TMH
6. Introduction to Computer Science, ITL ESL, Pearson Education

SEMSETER-3

B.SC.IT 31 : Computer Organization and Architecture

Unit 1 : Introduction Computer System, Components of a Computer System, Computer Organization

Unit-2 . Data Representation, Performance Factors, Central Processing Unit.

Unit-3 : Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes.

Unit 4 : Program Control, Program Interrupt, Control Unit, Introduction, Control Memory, Microprogramming, Computer Configuration

Unit-5 : Design of Control Unit , Overview of RISC/CISC Memory Organization and Input-Output Devices , Memory Hierarchy, Main Memory or Primary Memory

Unit-6 : Design of Main Memory ,Auxiliary Memory ,Virtual Memory, Memory Management ,Associative Memory

Unit 7: Introduction to Peripheral , Asynchronous Communication ,Asynchronous Serial Transfer, Asynchronous Communication Interface

Unit 8: Synchronous Communication, Character-Oriented Protocol, Input-Output Interface, Modes of Data Transfer, Interrupt , Multiple Interrupts ,Direct Memory Access (DMA)

Unit 9: Hardware Interfacing Issues, Introduction, I/O Processing, Bus Interface, I/O versus Memory Bus, Introduction, I/O Processing, Bus Interface, I/O versus Memory Bus

Unit-10: Data Transfer Techniques , Mode of Transfer , Software Routines, Direct Memory Access (DMA), Input-output Processor (IOP), CPU-IOP Communication, Channel.

Reference Books:
1. Computer organization and architecture by William Stallings
2. Essentials of Computer Organization and Architecture, Second Edition by Linda Null and Julia Lobur
3. Computer Architecture: A Quantitative Approach, 4th Edition by John L. Hennessy and David A. Patterson
4. Structured Computer Organization (5th Edition) by Andrew S. Tanenbaum
5. Computer Organization by V. Carl Hamacher, Zvonko G. Vranesic, and Safwat G. Zaky

B.SC.IT 32 : Data Structures Using C

Unit 11: Introduction to Data Structures, Basic Concepts, Algorithms, Notations, Data Structure operations Implementations of Data Structures, Pseudo-code for Algorithms , Mathematical Notations , Functions and Procedure

Unit 12: Arrays, Definitions, Array, Index or Subscript, Dimensions of an Array, Memory Allocation to Arrays, Memory Allocation to One-dimensional Array, Memory Representation of Two Dimensional Arrays. Memory

Allocation to Three Dimensional Array, Memory Allocation to Multidimensional Array, Static and Dynamic Variables, Pointer Type Variables ,Pointers in Pascal, Pointers in C, Static and Dynamic Memory Allocation

Unit 13: Linked Lists , Stack and Queue, Dynamic Allocation of Memory, Representation of Linked List, Implementation of Linked List, Insertion of a Node at the Beginning, Insertion of a Node at the End, Insertion of a Node after a Specified Node.

Unit 14 :Traversing the Entire Linked List, Deletion of a Node from Linked List, Concatenation of Linked Lists, Merging Linked Lists, Reversing of Linked List, , Applications of Linked List, Doubly Linked Lists, Circular Linked List, Generalised List.

Unit 15: Implementation of Stack, Array-based Implementation, Pointer-based Implementation, Applications of Stacks, Maze Problem, Evaluation of Expressions, Evaluating Postfix Expression, Simulating Recursive Function using Stack, Passing Arguments, Return from a Function, Simulation of Factorial, Proving Correctness of Parenthesis in an Expression.

Unit 16: Queue Implementation, Array-based Implementation, Pointer-based Implementation, Applications of Queues, Priority Queues

Unit 17: Trees, Graphs, Searching and Sorting,Trees, N-ary Tree, Linked Tree Representation, Binary Tree Traversal, Searching a Binary Tree, Heap Tree, AVL Trees, Threaded Trees, Splay Trees, B-Trees ,Linear or Sequential Search, Binary Search, Tree Searching, Breadth First Search (BFS), Depth First Search (DFS), General Search Trees, Hashing

Unit 18: Garbage Collection And Compaction, Dynamic Memory Allocation, Reference Counting Garbage Collection.

Unit 19: When Objects Refer to Other Objects, Why Reference Counting Does Not Work, Mark-and-Sweep Garbage Collection, The Fragmentation Problem, Stop-and-Copy Garbage Collection, The Copy Algorithm, Mark-and-Compact Garbage Collection, The Heap .

Unit 20: Singly Linked Free storage, Doubly Linked Free storage, Buddy System for Storage Management

Reference Books:

1. Purely functional data structures By Chris Okasaki
2. Algorithms and Data Structures :the science of computing by Chris Okasaki
3. Data Structures and Algorithms Bu Alfred V.Aho and Jeffrey D.Ullman

B.Sc.IT 33 Data Communications

Unit 21: Basic Concepts, Introduction, Data Communication Concepts, Data Communication Systems, Networks Network Models, Protocols and Standards.

Unit 22 :Introduction- Open Systems Interconnection (OSI) Reference Model, Layers in OSI Model, TCP/IP Reference Model

Unit 23: Physical Layer and Media Data and Signals, Introduction, Analog and Digital Signals, Periodic Analog Signal, Digital Signal, Transmission Impairments, Date Rate Limits, Performance.

Unit 24: Physical Media: Transmission Media, Introduction, Transmission Concepts and Terms, Bounded Media, Unbounded Media

Unit 25: Analog Transmissionv, Introduction, Modem Modulation Techniques ,Telephone Modems, Modulation of Analog Signal

Unit 2:6 The Data Link Layer, Introduction, Data Link Layer Design Issues, Error Detection and Correction, Types of Errors.

Unit 27: Elementary Data Link Protocols, Sliding Window Protocols, Protocol Verification, Example Data Link Protocols, Point-to-Point Protocol (PPP), Multiple Access Protocols

Unit 28: Local Area Networks ,Introduction-Local Area Network (LAN),Baseband versus Broadband, IEEE Standards for Local Area Networks.

Unit 29: IEEE 802.3 Ethernet Technologies, LAN Hardware, IEEE 802.4 Token Bus, IEEE 802.5 Token Ring, IEEE 802.6.

Unit-30: Distributed Queue Dual Bus, Connecting Lans And Backbone Networks, Switching In Networks, Internetworking and Routing

Reference Books:

1. Data communications and networking by Behrouz A. Forouzan.
2. Data and computer communications by William Stalling.
3. Telecommunications and Data Communications Handbook by Ray Horak
4. Business Data Communications and Networking by Jerry FitzGerald and Alan Dennis
5. Data Communications: From Basics to Broadband (4th Edition) by William J. Beyda

B.SC.IT 34 OOPS with C++

Unit 31: Classes and Objects, Introduction, Class, Object , Nature of Class, Types of Relationships.

Unit 32: "Kind of" Relationship, "Is a" Relationship, "Has a" Relationship/Part of Relationship, Classification of Classes, Abstraction

Unit 33: Constructors And Destructors And Operators Overloading,

Unit 34: Introduction, Constructors, Destructors, Introduction-Operators Overloading, Example, Type Conversion

Unit 35: Inheritance, Polymorphism And Virtual Functions,Introduction- Inheritance, Type of Inheritance,

Unit 36: Introduction- Polymorphism, Virtual Functions, Need for Virtual Functions, Rules for Virtual Functions

Unit 37: File Handling, Introduction, files, Stream Input/Output, Buffering and Flush, Exception Handling, String Handling.

Unit 38: Sequential Fixed Length Structure, Linked List Fixed Size Nodes, Strings Manipulations, Character String Output

Unit 39: Functions ,String Handling Functions Postfix Expression, Simulating

Unit 40: Arrays,Introduction, Arrays, Array Declaration, Important Points about Arrays , Multidimensional Arrays

Reference Books:

1. Object Oriented Programming With C++ - E Balagurusamy
2. Object Oriented Programming Using C++, Sanjeev Sofat, Cyber Tech. Publication
3. Starting Out with C++ Brief: From Control Structures through Objects (6th Edition) by Tony Gaddis
4. Introduction to Programming with C++ (2nd Edition) by Y. Daniel Liang
5. Beginning Programming with C by Stephen R.

SEMESTER-4

B.SC.IT 41: Computer Graphics

Unit 1: Overview of Computer Graphics,Introduction, Computer Graphics System, Interactive Graphics, Passive Graphics, Application of Computer Graphics

Unit-2: Display Devices Introduction, Display Devices, Cathode Ray Tube ,Bit-Mapped Graphics, Graphics Attributes, Refresh Cathode Ray Tubes, Random Scan Displays, Raster-Scan Displays

Unit 3: Color CRT Monitors, Direct-View Storage Tubes (DVST), Plasma Panel Displays, Thin Film Electroluminescent displays, Light Emitting Diode (LED) ,Liquid Crystal Displays (LCDs), Hard Copy Output Devices

Unit 4: 2-D Graphics, Introduction, Scan Conversion, Digital Differential Analyzer, Bresenham's Algorithm, Integer Bresenham's Algorithm, General Bresenham's Algorithm,

Unit 5:Circle Generation Algorithms , Bresenham's circle generation algorithm,Midpoint Circle Algorithm , Ellipse Generation algorithms,Midpoint Ellipse Algorithm, Arc Generation algorithms, Fill Algorithms, Fundamentals of Antialiasing, Dithering,2-D Graphics Transformations,Geometric and Coordinate Transformations, Transformation Composition.

Unit 6: 2-D View and Clipping, Exterior and Interior Clipping, Viewport Transformation, Polygon Clipping , Text Clipping

Unit 7: 3-D Graphicsi, ntroduction,3-D Graphics Transformations, Coordinate Transformations.

Unit 8: 3-D Projections, Perspective Projection on a Plane with C(0,0,0),Perspective Projection on a Plane with C(a,b,c),Parallel Projections.

Unit 9: 3-D Viewing and Clipping, Hidden Lines and Surfaces Scan line Entries (a) (b) (c) (d).

Unit-10: Importance of Wireframe Models, Demerits of Wireframe Models, Representing a Polygonal Net Model, Bezier Curves and Surfaces, B-Splines , Introduction, Multimedia Hardware, Multimedia Software Tools, Application Areas for Multimedia, Multimesdia Components Hypermedia, Multimedia Technology

Reference Books:

1. Computer graphics: principles and practice-James D. Foley
2. Computer Graphics C Version-Donald Hearn, M. Pauline Baker
3. Fundamentals of Computer Graphics by Peter Shirley and Steve Marschner
4. Computer Graphics: Principles and Practice in C (2nd Edition) by James D. Foley, Andries van Dam, Steven K. Feiner, and John F. Hughes
5. Interactive Computer Graphics: A Top-Down Approach Using OpenGL (5th Edition) by Edward Angel

B.SC.IT 42 Computer Network

Unit 11: Data Communication And System, Introduction, Purpose, Source, Transmitter or Sender, Transmission System, Receiver Destination.

Unit 12: Evolution of Communication, Technologies, Components, Data Transmission, Analog and Digital Data Transmission.

Unit 13: Data and Signal, Analog Signaling, Digital Signaling, Frequency Spectrum and Bandwidth.

Unit14: Time and Frequency Domain Concepts, Space-division Multiplexing

Unit 15: Transmission Media,Introduction, Magnetic Media, Twisted-pair Cables, Baseband and Broadband Coaxial, Cables, Fiber Optics

Unit 16: Computer Networks, LAN Applications and Benefits, Media Access Control, Centralized Control, Decentralized Control.

Unit17: Deterministic Access, Nondeterministic Media Access Control, LAN Hardware, Network Interface Card, LAN Operating systems, Transmission Media.

Unit 18: LAN Topologies, Bus Topology, Access Method and Collisions, LocalTalk, Ring Topology, Reliability Mechanisms, Star Topology, ATM for LANs

Unit 19: Networking, Introduction, Networking, Benefits of Networks, Different LAN and WAN Connections, Local Area Networks (LANs), Wide Area Networks (WANs)

Unit-20: Connecting to a Network, Setting the Computer Network, Networking Technologies, Connecting your Network to the Internet, Testing Connection

Unit 21: Access Control And Denial Of Service, access Control Overview, Access Control Objectives, Identification and Authentication.

Unit-22: Techniques, Access Control Techniques, Passwords, Memory Card, Smart Card, Hand-held Password Generators, Biometrics, Encryption, Token, Encrypted Keys.Access Control Methodologies.

Unit-23: Discretionary Access Control (DAC), Mandatory Access Control (MAC), Role Based Access Control (RBAC), Access Control Implementation, Security Administration Cost Reductions

Unit-24: Denial of Service Attack, Methods of Attack, Types of Denial of Service Attacks, Distributed Denial of Service Attack, How to Avoid the Problem, Firewalls and Intrusion Prevention Systems, Security Management and Risk Assessment.

Unit-25: Symmetric Encryption and Message Confidentiality, Internet Security Protocols and Standards, Internet Security Applications

Reference Books:

1. Corporate Computer and Network Security (2nd Edition) by R. R. Panko
2. Security+ Guide to Network Security Fundamentals by Mark D. Ciampa
3. Corporate Computer and Network Security (2nd Edition) by R. R. Panko
4. Security+ Guide to Network Security Fundamentals by Mark D. Ciampa
5. Network Security Essentials: Applications and Standards (4th Edition) by William Stallings

Semester V

B.Sc.IT 51: Software Engineering

UNIT 1: Software Process and Development Models Introduction, SDLC Models, What is a Software Process?,

UNIT2: Data Flow Diagrams, Petri Net Models, Object Models, Use Case Diagrams, Scenarios, Sequence Diagrams, Hierarchy Diagrams, State Diagrams, Lattice Models

UNIT 3: Software Project Management Introductions, Management Approaches, Team Approaches, Critical Practices, Capability Maturity Model

UNIT 4: Personal Software Process, Earned Value Analysis, Error Tracking, Postmortem Reviews

UNIT 5: Software Project Planning Project Planning, Software Scope, Cost Estimation

UNIT 6: PERT - Program Evaluation and Review Technique

UNIT 7: Software Cost Estimation, Software Estimation Risks, Software Metrics, Software measurement Theory

Unit 8: Risk Analysis and Management Introduction, Risk Identification, Risk Exposure, Risk Management Plans

UNIT 9: Guidelines for SE Curriculum Design and Delivery Guideline Regarding those Developing and Teaching the Curriculum, Guidelines for Constructing the Curriculum.

UNIT 10: Attributes and Attitudes that should Pervade the Curriculum and its Delivery, General Strategies for Software Engineering Pedagogy, Concluding Comment .

Reference Books:

1. Software Engineering (9th Edition) by Ian Sommerville
2. Software Engineering: A Practitioner's Approach by Roger S. Pressman
3. Software Engineering: Theory and Practice (4th Edition) by Shari Lawrence Pfleeger and Joanne M. Atlee
4. Schaum's Outline of Software Engineering by David A. Gustafson
5. Fundamentals of Software Engineering (2nd Edition) by Carlo Ghezzi, Mehdi Jazayeri, and Dino Mandrioli

B.Sc.IT 52: Algorithms

UNIT 11: Divide & Conquer Method Introduction, Divide and Conquer Method, Binary Search, Finding Maximum, and Finding Minimum.

UNIT 12: Merge Sort, Quick Sort, Strassen's Matrix Multiplication

UNIT 13: Greedy Method Introduction, Greedy Algorithm, Optimal Storage on Tape, Knapsack Problem, Making change (Money)

UNIT 14: Minimum Spanning Trees, Single Source Shortest Path Problem, Dijkstra's Algorithm

UNIT 15: Dynamic Programming Introduction

UNIT 16: Dynamic Programming, All Pair Shortest Path

UNIT 17: Optimal Binary search Trees, I/O Knapsack, The Traveling Salesperson Problem, Flow Shop Scheduling

UNIT 18: Backtracking Introduction, Backtracking, The 8 Queens Problem, Sum of Subsets, Knapsack Problem, Optimizing Backtracking, Graph Colouring.

UNIT 19: Graph Algorithms Applications of DFS, Strongly Connected Components (SCC) , Finding Biconnected Components (BCC) , Path problems , Bellman Ford SSSP Algorithm , Dijkstra's SSSP algorithm , Floyd-Warshall APSP algorithm.

UNIT 20: Maximum flows in graphs , Max Flow Min Cut , Ford and Fulkerson method 9.3.3 Edmond Karp augmentation strategy , Monotonicity Lemma and bounding the iterations , Global Mincut , The contraction algorithm , Probability of mincut

Reference Books:

1. Introduction to the Design and Analysis of Algorithms (2nd Edition) by Anany Levitin
2. Data Structures and Algorithm Analysis in Java (2nd Edition) by Mark Allen Weiss

B.SC.IT 53: Java

Unit 21 Fundamentals,Introduction, Basic Concepts of Object-oriented, Programming

Unit 22 Evolution of Java,Introduction, History of Java,

Unit-23 Features of Java. How Java differs from C and C++?.

Unit-24 Java and Internet, Java and world wide web, Web Browsers, Hardware and Software, Requirements,

Unit-25 Java Support Systems, Java Environment, Java Standard Library

Unit-26 Java Classes, Introduction, Data Types in Java, Variable Declaration, Type Casting, Vectors, Java Control Statements

Unit-27 What is a Class?, What are Methods?, Method Overloading, Constructor Overloading, Unstantiating Objects of a Class, Access Modifiers, Java Applications and Applets

Unit-28 Interface and Packages ,Introduction, Defining Interface, What is a Package?, ClassPath Variable, Accees Protection

Unit-29 Inheritance, Introduction, Inheritance Basics, Member Access and Inheritance.

Unit-30 SuperClass Variable and Sub Class Object

Reference Books:

1. Head First Java, 2nd Edition by Kathy Sierra and Bert Bates
2. Effective Java (2nd Edition) by Joshua Bloch
3. Introduction to Java Programming, Comprehensive (8th Edition) by Y. Daniel Liang
4. Java Programming by Joyce Farrell
5. Beginning Programming with Java For Dummies by Barry A. Burd

B.SC.IT 54 Network Programming

Unit 31 Introduction To The Internet And Internet Browsers,Introduction, Computers in Business , Networking ,Internet, Electronic Mail (E-mail), Resource Sharing, Gopher, World Wide Web, Usenet, Telnet, Bulletin Board Service, Wide Area Information Service.

Unit-32Introduction to Internet Explorer, Netscape Navigator, Designing a Home Page, History of HTML , HTML Generations , HTML Documents , Anchor Tag , Hyperlinks , _ Further Readings

Unit 33 Head and Body Sections and Ordered And Unordered LISTS , Introduction, Header Section , Title , Prologue , Links, Colorful Web Page , Comment Lines, Heading Printing, Aligning the Headings, Horizontal

Unit-34 Rule, Paragraph, Tab Setting, Images and Pictures, Embedding PNG Format Images ,Introduction, Lists , Unordered Lists , Headings in a List, Ordered Lists, Nested Lists

Unit 35 Table Handling and DHTMI And Style Sheets introduction, Tables , Table Creation in HTML , Width of the Table and Cells , Cells Spanning , Multiple Rows/Columns, Coloring Cells, Column Specification,, Defining Styles .

Unit 36 Elements of Style Linking a Style Sheet to an HTML Document , In-line Styles, External Style Sheets, Internal Style Sheets, Multiple Styles

Unit 37 Frames and Vbscript – Working With Variable, Introduction, Frameset Definition , Frame Definition, Nested Framesets Forms, Introduction, Action Attribute , Method Attribute, Enctype Attribute, What is a Variable.,

Unit 38 Data Types, What does it Mean to Declare a Variable?, Why Use Explicit Declarations in VBScript?, How do you Name a Variable?, Constants, Arrays, How do you Determine your VariableÊs Type?, VBScript Operators, What is a Control Structure?, Types of Controls, Examples of Control Structure

Unit 39 Introduction To Active Server Pages, Introduction, What are Active Server Pages?, Understanding the Client Server Model, How ASP Differs from Client-side Scripting Technologies, Setting Up Personal Web Server.

Unit-40 Setting Up Internet Information Server, Running ASP Pages, Using ASP without IIS or PWS, Creating your First ASP Pages,What are Objects? , The Building Blocks of Objects, Built-in ASP Objects, Collections, Working with Objects,Events

Reference Books:

1. Internet & World Wide Webby P.J. Deitel
2. Programming for TV, Radio & The Internet, Second Edition by Lynne Gross, Brian Gross, and Philippe Perebinossoff

3. Software Testing and Continuous Quality Improvement, Third Edition by William E. Lewis

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