DR. BHIMRAO AMBEDKAR UNIVERSITY, AGRA

DETAILED SYLLABUS FIFTH SEMESTER

Network Security

(BCA: 501)

UNIT-I: Network Security: Introduction: OSI Security Architecture-Classical Encryption techniques Cipher Principles, Data Encryption Standard, Block Cipher Design Principles and Modes of Operation.

UNIT-II Public Key Cryptography: Key Management, Diffie Hellman ky Exchange-Elliptic Curve Architecture and Cryptography, Introduction to Number Theory, Confidentiality using Symmetric Encryption, Public Key Cryptography and RSA.

UNIT-III: Authentication and Has Function: Authentication requirements, Authentication functions- Message Authentication Codes, Hash Functions, Security of Hash Functions and MACS, MDS message Digest algorithm, Secure Hash Algorithm, RIPEMD, HMAC Digital Signatures, Authentication Protocols, Digital Signature Standard.

UNIT-IV: Network Security: Authentication Applications; Kerberos, X,509 Authentication Service, Electronic Mail Security, PGP, S/MIME. IP Security, Web Security.

UNIT-V: System Level Security: Intrusion detection, password management, Viruses and related Threats, Virus Counter measures, Firewall Design Principles, Trusted Systems.

Visual Basic.Net

(BCA: 502)

UNIT-I Visual Basic .NET and the .NET Framework : Introduction to .net framework, Features, Common Language Runtime (CLR),Framework Class Library (FCL), Visual Studio.Net - IDE, Languages Supported, Components. Visual Programming, VB.net, Features, IDE, Menu System, Toolbars, Code Designer, Solution Explorer, Object Browser, Toolbox, Class View Window, Properties Window, Server Explorer, Task List, Output Window, Command Window.

UNIT-II Elements of Visual Basic .net: Properties, Events and Methods of Form, Label, Text Box, List Box, Combo Box, Radio Button, atton, Check Box, Progress Bar, Date Time Picker, Calendar, Picture ox, HScroll bar, VScroll Bar, Group Box, Tool Tip, Timer. UNIT-III: Programming in Visual basic net: Data Types, Keywords, Declaring Variables and Constants, Operators, Understanding Scope and accessibility of variables, Conditional Statements, if - then, -if- then else, Nested if, Select Case, Looping Statement, Do loop, For Loop, For Each, Next Loop, While Loop, Arrays, Static and Dynamic.

UNIT-IV Functions, Built-in Dialog Boxes, Menus and Toolbar: Menus and Toolbars, Menu Strip, Tool Strip, Status Strip, Built-in Dialog Boxes -Open File Dialogs, Save File Dialogs, Font Dialogs, Color Dialogs, Print Dialogs, Input Box, MsgB Interfacing With End user, Creating MDI Parent and Child, Functions and Procedures, Built-in Functions, Mathematical and String Functions, User Defined Functions and Procedures.

UNIT-V: Advanced Concepts in VB.Net: Object Oriented Programming, Creating Classes, Objects, Fields, Properties, Methods, Events, Constructors and destructors, Exception Handling, Models, Statements, File Handling, Using File Stream Class, File Mode, File Share, File Access Enumerations, Opening or Creating Files with File Stream Class, Reading and Writing Text using Stream Reader and Stream Writer Classes, Data Access with ADO Net What are Database? Data Access with Server Explorer, Data Adapter and Data Sets, ADO NET Objects and Basic SQL

Computer Graphics

(BCA: 503)

UNIT-I: Introduction: The Advantages of interactive Graphics, Representative Uses of Computer Graphics Classfication of Application Development of Hardware and software for computer Graphics Conceptun Framework for Interactive Graphics Overview, Scan Converting Lines, Scan Converting Circles Scan Converting Ellipses. UNI II: Hardcopy Technologies Display Technologies, Raster, Scan Display System, Video Controller, Ramdom, Scan Display processor, Input Devices for Operator Interaction, Image Scanners, Working Exposure on graphics tools like Dream Weaver, 3D Effects etc. Clipping Southland, Cohen Algorithm, Cyrus Beck Algorithm, Midpoint Subdivision Algorithm.

UNIT-III: Geometrical Transformation : 2D Transformation,

Homogeneous Coordinates and Matrix Representation of 2D

Transformation, composition of 2D Transformations, the Window to

Viewport Transformations, Introducation to 3D Transformations Matrix.

UNIT-IV: Representing Curves & Surfaces: Polygon meshes parametric, Cubic Curves, Quadric Surface Sold Modeling, Representing Solids, Regulatized Boolean Set Operation primitive instancing Sweep Representations, Boundary Representations, Spatial Partitioning Representations, Constructive Soild Geometry Comparison of Representations.

UNIT-V: Introductory Concepts: Multimedia Delinition, CD- ROM and the multimedia highway, Computer Animation (Design, types of animation, using different functions) UNIT-VI Uses of Multimedia. Introduction to making multimedia, The stage of Project, hardware & software requirements to make good multimedia skills and Training opportunities in Multimedia Motivation for Multimedia usae.

System Analysis and Design

(BCA: 504)

UNIT-1: Overview of Systems Concepts, Analysis and Design Life cycle, Introduction to System Concept: Characteristics of the system, Elements of a System, Types of Systems, Physical and Abstract System, Open and Closed System, Formal and Informal System, Introduction to Data and Information: Types of Information System, Categories of Information System. Needs of Informations Systems, Qualities of Information System, Software Development Life Cycle (SDLC), Role and Attributes of System Analyst-

UNIT-II: System Planning and Requirements Determination System planning and initial Investigation: Strategic Plan for Information processing. Tools for Planning, Problems in Planning, Need for requirement definition.

UNIT-III: Information gathering tools: Review of Literature, pracedes and forms, Methodologies, Tools and Techniques of Analysis Systems Analysis and Design; Decision Tree, Data Dictionary, Decision Table. Structured English, Data Flow Diagram, Components of a DFD, Zero Level DFD, DFD Transformation and Decomposition, Context Diagram Levelling a DFD, Feasibility Study Economic Feasibility (Cost & Benefit Analysis), Organizational Feasibility. Technical Feasibility, Behavioural Feasibility study.

UNIT-IV: System Design and implementation Process of Design : Logical and Physical Design, Design Methodologies, Elements of Form Design, Design of Output, Design of Input, Design of File, Design of procedure, Audit Trail, System implementation and Testing: Operational and Test Environment, Conversion Preparation, Database installation.

Users Training and Final Report to Management, Creating a new System, Test Plan: Activity Network for system Testing. Types of Testing. UNIT-V System Quality Assurance, IT infrastructure Selection and Evaluation of Processing and Maintenance Quality Assurance: Quality factors specification, Levels of Quality Assurance, Computer Hardware and Software Selection, Comuter Configuration Determination, Requesting Proposal from Vendors, Evaluation of Vendor's Proposals

Acceptance of system, Evaluation of Processing, Need of Maintenance.

Design and Analysis of Algorithm

(BCA: 505)

UNIT-I: Basic Concepts of Algorithms: Definition of algorithm, Characteristic of algorithm, Pseudo Codes & Time Complexity of Basic Control Structures, Time and Space Complexity of Insertion Sort, Selection Sort, Heap Sort, Bubble Sort, Asymptotic Notations (Growth of Functions).

UNIT-II: Divide and conquer : Binary Search, Maximum & Minimum, Merge Sort, Quick Sort, Greedy Method: General method, Knapsack Problem, Job Sequencing with deadline. Optimal Storage on tapes, Huffman Codes.

UNIT-III: Dynamic Programming: Matrix, Chain Multiplications, Longest Common Subsequence Backtracking: General Method,N Queens Problems, Sum of subsets.

UNIT-IV: Basic Traversals and search techniques, techniques of binary trees, techniques of graphs: BFS, DFS.

UNIT-V: Analysis of Graph Algorithms: Elementary Graph Algorithms, Multistage Graphs, Minimum Spanning Trees: Sruskal's & Algorithm, Single Source Shortest Path, Dijkstra's &

Bellman Ford, All Pairs Shortest Path: Warshal Algorithm.