

BCA 5th Semester

BCA-501: COMPUTER GRAPHICS AND ANIMATION

UNIT: 1

Introduction: Development of Computer graphics, basic graphics and standards. Raster scan and Random scan graphics, continual refresh and storages displays, display processors and character generations. Color display techniques, frame buffer and Bit Operations concepts in raster graphics.

UNIT: 2

Drawing Techniques : Point, lines and curves, scan conversion, line drawing algorithms, circle and ellipse generation, polygon filling, conic –section generation, ant aliasing.

UNIT: 3

Two– dimensional: Two- dimensional viewing, basic transformations, coordinate system, windowing and clipping, segments, interactive picture construction techniques, interactive input and output devices.

UNIT: 4

Three–dimensional: Three- dimensional concepts, 3-D representation and transformation, 3-D viewing, algorithms for 3-D volumes spline curves and surfaces.

UNIT: 5

Animation, Tweeking, morphing, Introduction to GKS primitive, Multimedia application

SUGGESTED READINGS:

1. Newman W.M. & Spraul R.F. "Principles of Interactive Computer Graphics", Mc Graw Hill, 1981.
2. Harington, "Introduction to Computer Graphics," Mc Graw Hill.
3. Hannen & Backer, Computer Graphics, PHI.

BCA-502: COMPUTER NETWORK

UNIT 1

Computer networks, Network Hardware—Local Area networks, Metropolitan Area networks,, Wide Area networks, Wireless networks, Internetworks, Network Software: Protocol Hierarchies, Design and Issue for layers, Interfaces and services, Connection oriented and Connection less Services. OSI reference model, and its Evolution, TCP/IP model.

UNIT 2

The Physical Layer: Transmission media, twisted pair, Base band and Broadband coaxial cable, Fiber optics, unguided media. MODEM, ISDN services, Switching Message, Packet Circuit switching TDM, and FDM.

UNIT 3

Data Link Layer, Error detection and Correction, Protocols: Simplex Stop and wait protocols, One bit sliding window protocol, Using Go-Back N. Flow control, Sliding Window Protocol, Channel Allocation Problem, Multiple Access Protocol: ALOHA, CSMA protocol, Collision Free protocol, Polling, FDM, TDM, Network layer: Routing Algorithm, Congestion Control Algorithm, IP Protocol, IP Addresses, subnets,

UNIT: 4

The Medium Access Sub Layer : Framing, Static and Dynamic Channel Allocation in LANs and MANs, IEEE Standard 802.3, and Ethernet IEEE standard 802.4 and token Ring, IEEE Standard 802.5, Token Bus, Bridges : Bridges from 802.x to 802.y, transport bridges, Source Routing Bridges, Gateways, Routers, ISDN, ATM, X.25.

UNIT: 5

The Network Layer : Network layer design issue, shortest path routing, Flooding, Flow-based routing, Broadcast routing, Congestion control and prevention policies; Internet working connectionless internetworking, tunneling Internet work, Routing, Fragmentation, Firewall, IP address, Internet Controls Protocols.

UNIT 6

Transport layer: Addressing, Establishing and releasing a connection, Multiplexing, Crash Recovery; TCP service Model, TCP protocol, The Application Layer: Network Security, Domain Name System, Email: Architecture and Services, Message formats, Message transfer.

SUGGESTED READINGS

1. Tanenbaum, A.S. "Computer Networks," PHI, 1990.
2. Stallings, W: Data and Computer Communication, Prentice Hall of India.
3. Fororuzan "Data Communication and Networking" TMH.

BCA-503 INTRODUCTION TO INTERNET PROGRAMMING

UNIT I

Java programming language overview, Referring to applets and applications, The first step in writing Java application, Basic Java application, Primary application components, Class code block, Data (variables), Method code block (main in example program), Using semicolons and braces, Compiling and running a program, Requirement for your source file, Compiling, Running the program

UNIT II

Java Primitive Types and Reference Types: Integral primitive types, Floating point primitive types, Textual primitive types: char, Logical primitive types: Boolean, Variable identifier conventions and rules, Picking a variable identify, Variable identifier naming rules, Variable identifier naming conventions, Using variables in a program, Constants, How primitives and constants are stores in memory, Using the string class as a data type, Using string and the new modifier, Using string without the new modifier, Values you can assign to string, How string are stores in memory, Using string reference variables, Using the main method.

UNIT III

Object References, Declaring an Object Reference, Creating Objects, Using Object Reference, Strings, Encapsulation, Inheritance, Using Inheritance, Containment Classes Abstract classes and Inheritance, Java2 Platform Class Library packages, Grouping classes in packages, Coding structure, Source file layout, Filenames, Java Methods & Object Interaction, Java Methods, Declaring methods, Invoking Methods, Types of methods, Passing Arguments, Method overloading, Constructors, Writing constructor, Object Interaction, Association, Composition, Composition and lifetime, Association and lifetime, Custody of an object, Typecasting, Promotion of expressions, Logical operations Arithmetic Conceptions, Arithmetic operators, Operators precedence, Increment and decrement operators, The if construct, The while loop, The for loop, while versus for, The do loop, The switch construct, The break statement, The continue statement, Java keywords

UNIT IV

Graphical user interface development, The Java. AWT Package Class Hierarchy, GUI Project, Frame, Adding a button, Creating panels and complex lay out, ActiveX Technologies & Implementation, ActiveX-based architecture, ActiveX controls, ActiveX documents, ActiveX code components, Implementing Client-Side Solutions, Introduction to scripting, Client-side scripting, Implementing ActiveX controls, Implementing Server-side Solutions, Introducing server-side scripting, Authoring active server pages (ASP), Reading a hypertext transfer protocol (HTTP) request, Creating an HTTP response, Saving user information, Using ActiveX server components, Using ActiveX design-time controls, Programming Interfaces, Other application programming interfaces (APIs), Messaging API (MAPI), Systems network architecture (SNA') APIs, Crypto API, Telephony API, License Service API, Speech API

SUGGESTED READINGS:-

1. "Complete reference". By Patric Naughton, Tata McGraw Hill.
2. Core Java Volume-I, Horstman and Cornell, Pearson Education
3. "Programming in java" by E. Balaguruswamy. TMH Publication.

BCA-504 : SOFTWARE ENGINEERING

UNIT I

The Evolution of software, Software Crisis, Software Engineering Paradigms The Changing Nature of Software Development, The Role of the Software Engineer, The software life cycle, The relationship of software engineering to other areas of computer science, Programming Languages, Operating Systems, Database, The evolving role of software, An Industry Perspective, Some Initial Solutions

UNIT II

Requirements Analysis, Analysis Tasks, The Analyst, Problems in Requirements Analysis, Communication Techniques, Analysis Principles, Requirements Analysis Methods, Data Structure Oriented Methods, Formal Specification techniques, Automated Techniques for Requirement Analysis, Important qualities of software product and process, Correctness, Reliability, Robustness, User Friendliness, Verifiability, Maintainability, Reusability, Portability, Data Abstraction, Modularity, Principles of software engineering

UNIT III

Structured Methodologies, Major Influencing factors, Evolution of End-User Computing, Emergence of CASE Tools, Use of Prototyping 4GL Tools, Relational Databases, Using the methodology, Choosing the Right Methodology, Implementing a Methodology, Current generations of software Development tools, Fourth Generation, Fifth Generation, Fourth Generation Languages, End –user computing, Prototyping, Non-procedural, Considerations in applications development, Problem in Applications Development, Limitation Of 4GLS, Impact OF 4GLS, Why study systems investigations?, The life cycle of an information system , Phase of Systems investigation, The people involved in a system investigation, Problems in System Investigations, General Principles of Systems Investigations

UNIT IV

Program Evaluation Review Technique (PERT), Methodology and standards, Expression of a Need, Perception of a Problem, Defining the problem, Relating the Problem to the domain of the Computer, Formalizing the Need, Stages in the Systems development life cycle, Specification Of Requirements, System Design, Programming, System Testing, Implementation, System Review, What is wrong with current development methods? Software and its increasing cost, Software errors and their impact, An Engineering Approach to Software, Case Tools, Generation of CASE Tools, Categories of CASE Tools, Selecting Case Tools, Deft Case Tools, Factors Affecting Software Development.

SUGGESTED READING:

1. Pressman. “A Practitioner approach to Software engineering”
2. Pnkaj Jalote. “An introduction to Software Engineering”.

BCA-505 Advanced Computer Architecture

1. Introduction to Parallel Processing :

Parallelism in uniprocessor systems; Parallel computer structures; Architectural classification schemes. Data driven computing and languages: Control Flow versus Data Flow Computers.

2. Memory Input-Output subsystems :

Memory Hierarchy, Addressing Schemes for Main Memory, Characteristics of cache memory ; Cache Memory Organization; Characteristics of inputoutput subsystems.

3. Pipelining and Vector Processing :

Pipelining: Principles of Linear Pipelining, Classification of Pipeline Processors, General Pipelines and Reservation Table Design of instruction pipelined units; Arithmetic Pipeline Design Examples, Job sequencing and collision prevention; Characteristic of Vector Processing, Vector supercomputers; Scientific attached processor; Architecture of star-100 and TI-ASC.

4. Structures and Algorithms for Array Processors :

SIMD array processor, SIMD interconnection networks: Illiac, Cube, Shuffle Exchange, Omega, Modified Omega, Barrel Shifter, Parallel algorithms for array processor: SIMD Matrix Multiplication, Parallel sorting on Array Processor.

5. Multiprocessor Architecture and Programming :

Functional structures : Loosely Coupled Multiprocessors, Tightly Coupled Multiprocessors; Interconnection Networks : UMA, MUMA, COMA, Time shared, Crossbar switch and Multiport Memories; Multiprocessor Operating Systems: Classification of Multiprocessor Operating Systems, Exploiting Concurrency for multiprocessing : Language features, Matrix multiplication on concurrent processor; Multiprocessor Scheduling Strategies: Dimensions of Multiple processor Management.

6. RISC and Superscalar Architecture :

Instruction set architectures, RISC Scalar processors; SPARC architecture, window register concept, Superscalar processors

References :

1. K. Hwang and F.A. Briggs, "Computer Architecture and Parallal Processing"
Mc Graw Hill Book Co. NY.
2. M.J. Flynn, "Computer Architecture : Pipelined And Parallel Processor
Design". Naros Publishing Co.
3. K. Hwang "Computer Architecture" Mc Graw Hill Co. NY.

BCA 6th Semester

BCA-601: MULTIMEDIA CONCEPTS & APPLICATION

UNIT I

Multimedia concepts, Introduction to basic techniques of multimedia development and delivery, Process of multimedia Production, Hardware/Software requirement for multimedia, Components of multimedia: Textual information, images, Animation, Digital Audio, Digital Video, Planning and Design of Multimedia, Production of multimedia, Distribution of Multimedia

UNIT II

Multimedia development Tools, Features of Software required for Multimedia: Integrating Multimedia Elements, Script Language Programs, Icon based programs, DLL, Hypertext, Cross Platform Capability, Runtime player for distribution, Authoring tools: author ware, Everest Authoring System, Icon author, Image Q, QuickTime

UNIT III

Elements of Hypertext: Nodes, Links, Annotations, Buttons, Editors, Browsers, Trails; Application of Hypertext: Business Applications, Computer Applications, Educational Applications, Entertainment and Leisure Applications; Planning Multimedia Program/Application: Goal, Outlining, Logic Flowchart, Program Story board, Creation of Building blocks, Copyright issue and management

UNIT IV

Developing multimedia building blocks: Text, Graphics, Sound and Video in multimedia applications, Application areas of Multimedia: Entertainment, Edutainment, Business Communications, Public Access, Knowledge transfer; Multimedia- an interactive system for Teaching and Learning: Simulations, Composition; Multimedia- as a technological challenge for developers.

SUGGESTED READINGS:

1. Tay Vaughan. "Multimedia make it work". 5th ed, TMH 2001.

BCA – 602: ARTIFICIAL INTELLIGENCE

UNIT -I

Introduction

Introduction to Artificial Intelligence, Simulation of sophisticated & Intelligent Behavior in different area problem Solving in games, natural language, automated reasoning, visual perception, heuristic algorithm versus solution guaranteed algorithms.

UNIT - II

Understanding Natural Languages.

Parsing techniques, context free and transformational grammars, transition nets, augmented transition nets, Fillmore's grammars, Shanks Conceptual Dependency, grammar free analyzers, sentence generation, and translation.

UNIT III

Knowledge Representation

First order predicate calculus, Horn Clauses, Introduction to PROLOG, Semantic Nets, Partitioned Nets, Minsky frames, Case Grammar Theory, Production Rules Knowledge Base, The Interface System, Forward & Backward Deduction.

UNIT - IV

Expert System

Existing Systems (DENDRAL, MYCIN) domain exploration Meta Knowledge, Expertise Transfer, Self Explaining System

UNIT - V

Pattern Recognition

Introduction to Pattern Recognition, Structured Description, Symbolic Description, Machine perception, Line Finding, Interception Semantic & Model, Object Identification, Speech Recognition.

Programming Language

Introduction to programming Language, LISP, PROLOG

References:

1. Charnick "Introduction to A.I.", Addison Wesley
2. Rich & Knight, "Artificial Intelligence"
3. Winston, "LISP", Addison Wesley
4. Marcellous, "Expert System Programming", PHI
5. Elamie, "Artificial Intelligence", Academic Press
6. Lioyed, "Foundation of Logic Processing", Springer Verlag

BCA-603: WEB TECHNOLOGY

UNIT: 1

History of the Internet and World Wide Web, Growth of the Web, Protocols- HTTP,FTP, SMTP, POP3, MIME,IMAP, Choosing an ISP, Introduction to Internet Services, E-mail concepts, Sending and Receiving secure E-Mail, Introduction to XML.

UNIT: 2

Web project, Web Team, Communication Issues, the Client, Multi- departmental & large scale Websites, Quality Assurance and Testing, Technological advances and Impact on Web Teams, Overview of Static or Dynamic Web page, Portal, Search engine.

UNIT: 3

HTML: Concept of Hypertext, Versions of HTML, Elements of HTML, Formatting Tags, Links, Hyperlinks, Image & Image map, List, Tables, Frames, Forms, Style sheets, Background and Color Controls.

DHTML: Introduction to DHTML, Advanced Netscape DHTML, Advanced Microsoft DHTML & Cross browser DHTML.

UNIT: 4

The .NET framework : Introduction, Common Language Runtime, Common Type System, Common Language Specification, The Base Class Library, The .NET class library, Intermediate language, Just-in-Time compilation, garbage collection, Application & Assemblies, Web Services, Unified classes.

UNIT: 5

ASP.NET: Features of ASP.NET, Differences between ASP and ASP.NET, Create an ASP.NET Web application, ASP.NET Web forms, ASP.NET Controls- Validation Controls, Web Server Controls, ADO.NET.

SUGGESTED READINGS:-

1. Burdman, "Collaborative Web Development", Addison Wesley.
2. Sharma & Sharma, "Developing E-Commerce Sites", Addison Wesley.
3. Ivan Bayross, "Web Technologies Part II", BPB Publications.
4. "ASP.NET 21 Days", TMH.
5. "Web Technology", Laxmi Publication.
6. DOT NET Framework with ASP.NET & C#", Dhanpat Rai Publication
7. Magic with HTML, DHTML and Javascript", Laxmi Publication

BCA-604 Introduction to .NET

UNIT 1

An overview of the .NET framework. Common Language Runtime (CLR), the .NET Framework class library (FCL), ASP.NET to support Internet development and ADO.NET to support database applications. Languages supported by .NET., An introduction to Visual Studio .NET.

UNIT 2

An introduction to C#, Program structure., Basic IO, including output to the console and messages boxes., Data types, Arithmetic operations and expressions, Relational and logical operations, Control structures. These include "if", "while", "do-while", "for", and "switch", Namespaces and methods supplied by the FCL. Writing methods. Recursion and overloading Scoping rules. Arrays and data representation. Class definitions. Properties, indexers, and access control. Inheritance and polymorphism. Delegates. Exception handling.

UNIT 3

GUI Programming. This section will involve the use of forms to build GUI applications. The concept of event handling will be introduced. The creation of various dialog boxes and menus will be discussed.

UNIT 4

Files. This is an important topic beyond its obvious purpose. The same tools that allow us to access file data also allow use to read data from internet sites and databases.

UNIT 5

The Framework Class Library (FCL) , Containers. Multithreading. Graphic programming.

SUGGESTED READINGS

1. Dietel et al. **Visual C# 2008 How to program.** Prentice-Hall Inc, 2009.