

**BE VI SEMESTER COMPUTER SCIENCE & ENGG.****COURSE CONTENTS (UEC SCHEME)**

<b>CS-6007</b>	<b>Advance Computer Architecture &amp; Peripherals</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Max. Marks</b>	<b>Min. Marks</b>
Duration	3 Hours	3	1	2	6	70	22

**BE VI SEMESTER COMPUTER SCIENCE & ENGG.****COURSE CONTENTS (UEC SCHEME)**

<b>CS-6002</b>	<b>Computer Network</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Max. Marks</b>	<b>Min. Marks</b>
Duration	3 Hours	3	1	2	6	70	22

**Unit I**

Computer Network: Definitions, goals, components, structure, Architecture, Classifications & types, Growth, Complexity and applications etc. Layered Architecture: Protocol hierarchy, Connection Oriented & Connectionless Services, Service primitives, Design issues & its functionality. ISO-OSI Reference Model: Principle, Model, Descriptions of various layers and its comparison with TCP/IP. Network standardization. Examples of Networks: Telecommunication Network, Corporate Networks, Connection oriented network i.e., X.25, Frame relay & ATM, Wireless LAN 802.11, internet, Intranet, Extranet, SNA & DNA etc.

**Unit II**

Data Link Layer: Need, Services Provided, Framing & its methods, Flow Control, Error control. DLL Protocol: Elementary & Sliding Window. Piggybacking & Pipelining. Protocol verification: Finite State Machine Models & Petri net models. Example in Data Link Layers: HDLC & Internet. Comparison of BISYNC and HDLC Features. Bridges and layer-2 switches

**Unit III**

MAC Sub layer: Static & Dynamic channel allocation, Media access control for LAN & WAN. Classification of MAC Sub layer protocol, Study of various collision, Collision free & limited contention protocol i.e., ALOHA : pure, slotted , CSMA, CSMA/CD, CSMA/CA, Bit Map, Binary count down, BRAP, MLMA, Adaptive tree walk & urn protocol etc. IEEE 802 standards for LAN & MAN & their comparison. Ethernet: Cabling, Binary exponentials algorithms, performance fast Ethernet, Gigabit Ethernet, FDDI. Wireless LANs, Broadband Wireless, Bluetooth: Architecture, Application & Layering.

**UNIT IV**

Network Layer: Need, Services Provided , Design issues, Routing algorithms: Least Cost Routing algorithm, Dijkstra's algorithm, Bellman-ford algorithm, Hierarchical Routing, Broadcast Routing, Multicast Routing, Routing for mobile hosts, Routing in Ad Hoc Networks Routing Strategies, Congestion Control Algorithms: General Principles of Congestion control, Prevention Policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram subnets. IP protocol, IP Addresses, Comparative study of IPv4 & IPv6, Mobile IP.

**Unit V**

Processes to Processes Delivery – Transmission Control Protocol (TCP) - User Datagram Protocol, Data Traffic, Congestion Control and Quality of Service, Techniques to improve QOS, Integrated Services, and Differentiated Services. DNS,SMTP, FTP, HTTP, WWW, Virtual Terminal Protocol, VoIP: BasicIP Telephone System,H.323 Characteristic & Layering, SIP Characteristics, Method & Sessions.

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**List of Experiments:**

1. To study Communication Guiding system
2. To study various types of connectors.
3. To study of different type of LAN equipments.
4. Study and verification of standard Network topologies i.e. Star, Bus, Ring etc
5. LAN installations and their Configurations.
6. To implement various types of error correcting techniques.
7. To implement various types of framing methods.
8. To implement various types of DLL protocols.
9. To study & configure various types of router & Bridges.
10. To implement various types of routing algorithm.
11. To study of Tool Command Language (TCL).
12. Study and Installation of Standard Network Simulator, N.S-2.
13. Study & Simulation of MAC Protocols like Aloha, CSMA, CSMA/CD and CSMA/CA using Standard Network Simulator.
14. Study & Simulation of Routing Protocols using Standard Network Simulator.
15. Study & implementations of VoIP Concepts.
16. Implementation & Comparisons of various types of Cryptographic algorithms.

**Suggested Reading:**

1. Tanenbaum A. S," Computer Networks "Pearson Education.
2. Stalling W, "Computer Networks", Pearson Education
3. Douglas E. Comer & M.S Narayanan," Computer Network & Internet", Pearson Education
4. Behraj A Forouzan,"Data Communication & Networking", McGraw-Hill.
5. Natalia Olifar & Victor Olifer," Computer Networks", Willey Pub.
6. Prakash C. Gupta, "Data Communications and Computer Networks", PHI
7. Bertsekas & Gallager "Data Network" , PHI
8. Gallo," Computer Communication & Networking Technologies", engage Learning

BE VI SEMESTER COMPUTER SCIENCE & ENGG.							
COURSE CONTENTS (UEC SCHEME)							
CS-6008	Distributed System	L	T	P	C	Max. Marks	Min. Marks
Duration	3 Hours	3	1	2	6	70	22

### Unit-I

#### Introduction to distributed systems:

Architecture for Distributed System, Goals of Distributed system, Hardware and Software concepts, Distributed Computing Model, Advantages & Disadvantage distributed system, Issues in designing Distributed System,

### Unit-II

#### Distributed Share Memory And Distributed File System:

Basic Concept of Distributed Share Memory (DSM), DSM Architecture & its Types, Design & Implementations issues In DSM System, Structure of Share Memory Space, Consistency Model, and Thrashing. Desirable features of good Distributed File System, File Model, File Service Architecture, File Accessing Model, File Sharing Semantics, File Catching Scheme, File Application & Fault tolerance. Naming: - Features, System Oriented Names, Object Locating Mechanism, Human Oriented Name.

### Unit-III

#### Inter Process Communication And Synchronization:

API for Internet Protocol, Data Representation & Marshaling, Group Communication, Client Server Communication, RPC- Implementing RPC Mechanism, Stub Generation, RPC Messages. Synchronization: - Clock Synchronization, Mutual Exclusion, Election Algorithms:- Bully & Ring Algorithms.

### Unit-IV

#### Distributed Scheduling and Deadlock:

Distributed Scheduling-Issues in Load Distributing, Components for Load Distributing Algorithms, Different Types of Load Distributing Algorithms, Task Migration and its issues. Deadlock-Issues in deadlock detection & Resolutions, Deadlock Handling Strategy, Distributed Deadlock Algorithms.

### Unit-V

#### Distributed Multimedia & Database system:

Distributed Data Base Management System (DDBMS), Types of Distributed Database, Distributed Multimedia:- Characteristics of multimedia Data, Quality of Service Managements. Case Study of Distributed System:- Amoeba, Mach, Chorus

### References:

1. Sinha, Distributed Operating System Concept & Design, PHI
2. Coulouris & Dollimore, Distributed System Concepts and Design, Pearson Pub
3. Singhal & Shivratri, Advance Concept in Operating System, McGraw Hill
4. Attiya & Welch, Distributed Computing, Wiley Pub.

BE VI SEMESTER COMPUTER SCIENCE & ENGG.							
COURSE CONTENTS (UEC SCHEME)							
CS-6004	Computer Graphics & Multimedia	L	T	P	C	Max. Marks	Min. Marks
Duration	3 Hours	3	1	2	6	70	22

#### Unit-I:

Introduction to raster scan displays, Pixels, frame buffer, Vector & Character generation, random scan systems, Graphics Primitives, Display devices, Display file structure, Scan Conversion techniques, line drawing: simple DDA, Bresenham's Algorithm, Circle Drawing Algorithms. Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms

#### Unit-II:

2D transformation: Translation, Rotation, Scaling, Shearing, Reflection. Inverse Transformation, Homogenous coordinate system, Matrices Transformation, Composite Transformation. Windowing & Clipping: World Coordinate System, Screen Coordinate System, Viewing Transformation, Line Clipping, Cohen Sutherland, Midpoint Line clipping algorithms, Polygon Clipping: Sutherland –Hodgeman, Weiler-Atherton algorithms.

#### Unit-III:

3D transformations: translation, rotation, scaling. Parallel & Perspective Projection, Types of Parallel & Perspective Projection. Hidden Surface elimination: Depth comparison, Back face detection algorithm, Painters algorithm, Z-buffer algorithm. Curve generation, Bezier and B-spline methods.

#### Unit-IV:

Basic Illumination Model, Diffuse reflection, Specular reflection, Phong Shading Gourand shading, ray tracing, color models like RGB, YIQ, CMY, HSV.

#### Unit -V:

Multimedia System: An Introduction, Multimedia hardware, Multimedia System Architecture. Data & File Format standards. i.e RTF, TIFF, MIDI, JPEG, DIB, MPEG, Audio: digital audio, MIDI, processing sound, sampling, Compression. Video: Avi, 3GP, MOV, MPEG, compression standards, compression through spatial and temporal redundancy. Multimedia Authoring .

#### Suggested Reading:

1. Donald Hearn and M.P. Becker "Computer Graphics" Pearson Pub.
2. Rogers, "Procedural Elements of Computer Graphics", Tata McGraw Hill
3. Foley Vandam, Feiner, Hughes "Computer Graphics Principle & Practice" , Pearson Pub.
4. Sinha and Udai , "Computer Graphics", Tata McGraw Hill
5. Parekh "Principles of Multimedia" Tata McGraw Hill
6. Prabhat k Andleigh, Kiran Thakral , "Multimedia System Design " PHI Pub.
7. Shuman "Multimedia in Action", Cengage Learning

BE VI SEMESTER COMPUTER SCIENCE & ENGG.							
COURSE CONTENTS (UEC SCHEME)							
CS-6005	Software Engineering	L	T	P	C	Max. Marks	Min. Marks
Duration	3 Hours	3	1	2	6	70	22

#### Unit I:

**The Software Product and Software Process:** Software Product and Process Characteristics, Software Process Models: Linear Sequential Model, Prototyping Model, RAD Model, Evolutionary Process Models like Incremental Model, Spiral Model, Component Assembly Model, RUP and Agile processes. Software Process customization and improvement, CMM, Product and Process Metrics

#### Unit II:

**Requirement Elicitation, Analysis, and Specification:** Functional and Non-functional requirements, Requirement Sources and Elicitation Techniques, Analysis Modeling for Function-oriented and Object-oriented software development, Use case Modeling, System and Software Requirement Specifications, Requirement Validation, Traceability

#### Unit III:

**Software Design:** The Software Design Process, Design Concepts and Principles, Software Modeling and UML, Architectural Design, Architectural Views and Styles, User Interface Design, Function-oriented Design, SA/SD Component Based Design, Design Metrics

#### Unit IV:

**Software Analysis and Testing:** Software Static and Dynamic analysis, Code inspections, Software Testing Fundamentals, Software Test Process, Testing Levels, Test Criteria, Test Case Design, Test Oracles, Test Techniques, Black-Box Testing, White-Box Unit Testing and Unit Testing Frameworks, Integration Testing, System Testing and other Specialized Testing, Test Plan, Test Metrics, Testing Tools., Introduction to Object-oriented analysis, design and comparison with structured software engg.

#### Unit V:

**Software Maintenance & Software Project Measurement:** Need and Types of Maintenance, Software Configuration Management (SCM), Software Change Management, Version Control, Change control and Reporting, Program Comprehension Techniques, Re-engineering, Reverse Engineering, Tool Support. Project Management Concepts, Feasibility Analysis, Project and Process Planning, Resources Allocations, Software efforts, Schedule, and Cost estimations, Project Scheduling and Tracking, Risk Assessment and Mitigation, Software Quality Assurance (SQA). Project Plan, Project Metrics.

#### Practical and Lab work

Lab work should include a running case study problem for which different deliverables at the end of each phase of a software development life cycle are to be developed. This will include modeling the requirements, architecture and detailed design. Subsequently the design models will be coded and tested. For modeling, tools like Rational Rose products. For coding and testing, IDE like Eclipse, Net Beans, and Visual Studio can be used.

#### Suggested Reading:

1. Pankaj Jalote, "An Integrated Approach to Software Engineering", Narosa Pub, 2005
2. Rajib Mall, "Fundamentals of Software Engineering" Second Edition, PHI Learning
3. R S. Pressman, "Software Engineering: A Practitioner's Approach", Sixth edition 2006, McGraw-Hill.
4. Sommerville, "Software Engineering", Pearson Education.
5. Richard H. Thayer, "Software Engineering & Project Managements", Willey India
6. Waman S. Jawadekar, "Software Engineering", TMH
7. Schwalbe, "IT Project Managements", Cengage Learning.

**BE VI SEMESTER COMPUTER SCIENCE & ENGG.****COURSE CONTENTS (UEC SCHEME)**

<b>CS-6006</b>	<b>Minor Project</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Max. Marks</b>	<b>Min. Marks</b>
Duration	3 Hours	0	0	2	2	30	10