SCHEME OF INSTRUCTION & EXAMINATION
B.E. - V SEMESTER
(INFORMATION TECHNOLOGY)

Sl. No.	Course Code	Course Title	Scheme of Instruction			Duration in Hrs	Scheme of Examination		Credits
			Periods Per week				Maximum Marks		
			L	T	D/P		CIE	SEE	
Theory Courses									
1.	PC 501 IT	Software Engineering	3	1	0	4	30	70	3
2.	PC 502 IT	Database Systems	3	1	0	4	30	70	3
3.	PC 503 IT	Operating Systems	3	1	0	4	30	70	3
4.	PC 504 IT	Automata Theory	3	1	0	4	30	70	3
5.	PC 505 IT	Computer Networks	3	1	0	4	30	70	3
6.	PE-I	Professional Elective - I	3	0	0	3	30	70	3
Practical/Laboratory Courses									
7.	PC531 IT	CN /Operating Systems Lab	0	0	2	2	25	50	1
8.	PC532 IT	Database Lab	0	0	2	2	25	50	1
9.	PW533 IT	Mini Project – III	0	0	2	-	25	50	1
TOTAL									21

Profession Elective - I	
Course Code	Course Title
PE 511 IT	Artificial Intelligence
PE 512 IT	Computer Graphics
PE 513 IT	Multimedia Technologies

PC: Professional Course PE: Professional Elective D: Drawing P: Practical
L: Lectures T: Tutorials PW: Project Work
CIE: Continuous Internal Evaluation SEE: Semester End Examination (Univ. Exam)

PC 501IT SOFTWAREENGINEERING

Instruction: (3L+1T) Hours/Week
Duration of University Examination: 3 Hours
University Examination (SEE): 70 Marks
Sessional (CIE): 30 Marks

Course Objectives

- To introduce the basic concepts of software development- processes from defining a product to shipping and maintaining that product
- To impart knowledge on various phases, methodologies and practices of software development
- To understand importance of software modelling using UML .
- To understand the importance of testing in software development and study various testing strategies and software quality metrics.

UNIT-I: Introduction to Software Engineering: A generic view of Process: Software Engineering, Process Framework, CMM Process Patterns, Process Assessment.
Process Models: Prescriptive Models, Waterfall Model, Incremental Process Models, Evolutionary Process Models, Specialized Process Models, The Unified Models, Personal and Team Process Models, Process Technology, Product and Process.
An Agile view of Process: Introduction to Agility and Agile Process, Agile Process Models.

UNIT-II: Requirements Engineering: A Bridge to Design and Construction, Requirements Engineering Tasks, Initiating Requirements Engineering Process, Eliciting Requirements, Developing Use-Cases, Building the Analysis Model, Negotiating Requirements, Validating Requirements.
Building the Analysis Model: Requirements Analysis Modeling Approaches, Data Modeling Concepts, Object-Oriented Analysis, Scenario-based Modeling, Flow-oriented Modeling, Class-based Modeling, Creating a Behavioral Model.

UNIT-III: **Design Engineering:** Design within the context of SE, Design Process and Design Quality, Design Concepts, The Design Model, Pattern-based Software Design.
Creating an Architectural Design: Software Architecture, Data Design, Architectural Styles and Patterns, Architectural Design, Assessing Alternative Architectural Designs, Mapping Data Flow into a Software Architecture.

UNIT-IV: Introduction to UML: Importance of Modeling, Principles of Modeling, Conceptual model of the UML, Basic Building Blocks of UML
Basic Structural Modeling: Classes, Relationships, Common Mechanisms and Diagrams, Class Diagrams. Modeling techniques for Class Diagrams
Basic BehavioralModeling: Interactions, Interaction diagrams, Use cases, Use case Diagrams, Activity Diagrams, State chart diagrams
Architectural Modeling: Component Diagrams and Deployment Diagrams.

UNIT-V: Software Quality Assurance: Basic Elements, Tasks, Goals and Metrics, Formal Approaches, Statistical Software Quality Assurance, Software Reliability, ISO 9000 Quality Standards, SQA Plan.

Testing Strategies: A Strategic Approach to Software Testing, Strategic Issues, Test Strategies for O-O Software, Validation Testing, System Testing, The Art of Debugging.

Testing Tactics: Software Testing Fundamentals, Black-box and White-box Testing, Basis Path Testing, Control Structure Testing.

Suggested Reading:

1. Roger S.Pressman, Software Engineering: A Practitioners Approach, Seventh Edition, McGrawHill, 2009.
2. Grady Booch, James Rumbaugh, Ivor Jacobson, "The Unified Modelling Language-User Guide (Covering UML 2.0)", Second Edition, Pearson Education, India, 2007
3. Ali Behforoz and Frederic J.Hadson, Software Engineering Fundamentals, Oxford University Press, 1996.
4. PankajJalote "An Integrated Approach to Software Engineering, Third Edition, Narosa Publishing house, 2008.

PC 502 IT DATABASE SYSTEMS

Instruction:	(3L+1T) Hours/Week
Duration of University Examination:	3 Hours
University Examination(SEE):	70 Marks
Sessional(CIE):	30 Marks

Course Objectives:

- To introduce three schema architecture and DBMS functional components.
- To learn formal and commercial query languages of RDBMS.
- To understand the principles of ER modelling and theory of normalization.
- To study different file organization and indexing techniques.
- To familiarize theory of serializability and implementation of concurrency control, and recovery

UNIT – I: Introduction: Database System Applications, Purpose of Database Systems, View of Values, Nested Sub-queries, Complex Queries, Views, Modification of the Database, Joined Relations
Data, Database Languages, Relational Databases, Database Design, Object–based and Semi-structured Databases, Data Storage and Querying, Transaction Management, Data Mining and Analysis, Database Architecture, Database Users and Administrators. Database Design and the E-R Model: Overview of the Design Process, The Entity- Relationship Model, Constraints, Entity-Relationship Diagrams, Entity – Relationship Design Issues, Weak Entity Sets, Extended E-R Features, Database Design for Banking Enterprise, Reduction to Relational Schemas, Other Aspects of Database Design.

UNIT – II: Relational Model: Structure of Relational Databases, Fundamental Relational-Algebra Operations, Additional Relational – Algebra Operations, Extended Relational - Algebra Operations, Null Values, Modification of the Databases. Structured Query Language: Data Definition, Basic Structure of SQL Queries, Set Operations, Aggregate Functions, Null.

UNIT – III: Advanced SQL: SQL Data Types and Schemas, Integrity Constraints, Authorization, Embedded SQL, Dynamic SQL, Functions and Procedural Constructs, Recursive Queries, Advanced SQL Features. Relational Database Design: Features of Good Relational Design, Atomic Domains and First Normal Form, Functional-Dependency Theory, Decomposition using Functional Dependencies.

UNIT – IV: Indexing and Hashing: Basic Concepts, Ordered Indices, B+-tree Index Files, B-tree Index Files, Multiple-Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices. Index Definition in SQL Transactions: Transaction Concepts, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for Serializability

UNIT – V: Concurrency Control: Lock-based Protocols, Timestamp-based Protocols, Validation-based Protocols, Multiple Granularity, Multi-version Schemes, Deadlock Handling, Insert and Delete Operations, Weak Levels of Consistency, Concurrency of Index Structures.
Recovery System: Failure Classification, Storage Structure, Recovery and Atomicity, Log-Based Recovery, Recovery with Concurrent Transactions, Buffer Management, Failure with Loss of Nonvolatile Storage, Advanced Recovery Techniques, Remote Backup Systems

Suggested Readings:

1. Abraham Silberschatz, Henry F Korth, S Sudarshan, Database System Concepts, McGraw-Hill International Edition, 6th Edition, 2010
2. Ramakrishnan, Gehrke, Database Management Systems, McGraw-Hill International Edition, 3rd Edition, 2003.
3. Elmasri, Navathe, Somayajulu, Fundamentals of Database Systems, Pearson Education, 4th Edition, 2004

PC 503 IT OPERATING SYSTEMS

Instruction:	(3L+1T)Hours/Week
Duration of University Examination:	3 Hours
University Examination(SEE):	70 Marks
Sessional(CIE):	30 Marks

Course Objectives:

- To understand the working of computer system in terms of the different operations performed and services provided by it.
- To understand the functions and management of different resources of the system (Processor, I/O, and Memory etc)
- To understand issues of protection and security.
- To understand real time operating systems and case studies.

UNIT-I

Introduction: Computer System organization & Architecture, Operating System Structure &Operations,Process, Memory and Storage Managements, Protection and Security, Distributed and Special-Purpose Systems, Computing Environments.

System Structures: Operating-System Services, User Operating System Interface, System calls,TypesofSystem Calls, System Programs, Operating-System Structure, Virtual Machines, Operating – SystemGeneration, System Boot.

Process Concept: Overview, Process Scheduling, Operations on Processes, Interprocesscommunication,Examples of IPC Systems, Communication in Client/Server Systems.

Multithreaded Programming*:* Overview, Multithreading Models, Thread Libraries, Threading Issues,Operating-System Examples.

UNIT II

Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multi-ProcessorScheduling, Thread Scheduling: Pthreads , Operating System Examples, Algorithm Evaluation.

Process Coordination and Synchronization: Background, The Critical-Section Problem, Peterson'sSolution,Synchronization, Monitors, Synchronization Examples.

Deadlocks: System Model, Deadlock characterization, Methods for Handling Deadlocks,DeadlockPrevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.

UNIT III

Memory-Management Strategies: Background, Swapping, Contiguous Memory Allocation, Paging,Structure of the Page Table, Segmentation, Example: The Intel Pentium.

Virtual Memory Management: Background, Demand paging, Copy-on-write, PageReplacement,Allocation of Frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory, Other Considerations,

Storage Management: File System, File Concept, Access Methods, Directory Structure, File-SystemMounting, File sharing, Protection.

UNIT IV

Implementing File Systems: File System-Structure, File-System Implementation, DirectoryImplementation, Allocation Methods, Free-Space Management, Efficiency and Performance, Recovery, Log-Structured File Systems, NFS.

Secondary –Storage Structure: Overview of Mass-Storage Structure, Disk Structure,DiskAttachment, RAID Structure, Stable-Storage Implementation, Tertiary-Storage Structure.

I/O Systems: Overview, I/O Hardware, Application I/O Interface, Kernel I/OSubsystems,Transforming I/O Request to Hardware Operations, STREAMS, Performance.

UNIT V

Protection *and Security:*Goals of Protection, Principles of Protection, Domain of protection, AccessMatrix,Implementation of Access Matrix, Access control, Revocation of access rights, Capability-based Systems, Language-based protection.

System Security: The security problem, program Threats, System and System Network Threats, Cryptographyas a Security tool, User Authentication, Implementing Security Defences, Firewalling to protect Systems and Networks, Computer Security Classification, Case Studies-Linux System.

Real-time systems: - Overview, System Characteristics, Features of Real time kernels, Implementing Real time operating Systems, Real Time CPU Scheduling, An Example: VxWorks, Linux System.

Suggested Reading:

1. Abraham Silberschatz, Peter Galvin, Greg Gagne, Operating Systemprinciples, seventh Edition, John wiley& sons publication,2006 .
2. A.Tanenbaum-Modern Operation Systems. Third edition, Pearson Education, 2008.
3. William Stallings-Operating Systems, Fifth Edition, Pearson Education, 2005.
4. Ida M.Flynn, Understanding Operating Systems, Sixth Edition, Cengage, 2011

PC 504 ITAUTOMATA THEORY

Instruction	**(3L + 1T) Periods per week**
Duration of University Examination	**3 Hours**
University Examination	**70 Marks**
Sessional	**30 Marks**

Course Outcomes:

1. Design and use deterministic, nondeterministic, and epsilon transition finite state automata and illustrate state transition on symbols of input words and establish the corresponding language of automata.
2. Analyze Regular Expressions and use Laws and establish the corresponding Regular Language. Prove a given language is regular or otherwise. Use Closure and Decision Properties of Regular Language.
3. Analyze ambiguity. Develop Context Free Grammars, Parse Tees and establish Context Free Language. Use Closure and Decision Properties of Regular Language.
4. Design Pushdown Automata and illustrate the working. Develop deterministic Pushdown Automata and establish equivalence of language of PDA and CFG.
5. Design Turing Machine and illustrate its working, implement programming techniques for Turing Machines, analyze extended and restricted Turing Machines for computational abilities, and establish the Recursively Enumerable language of Turing Machine and analyze the Undecidable problems.

UNIT I: Automata: Introduction to Finite Automata, Central Concepts of Automata Theory.
Finite Automata: An informal picture of Finite Automata, Deterministic Finite Automata, Nondeterministic Finite Automata, An Application, Finite Automata with Epsilon Transitions.

UNIT II: Regular Expression And languages: Regular Expressions, Finite Automata and Regular Expression, Applications of Regular Expressions, Algebric Laws for Regular Expression.
Properties of Regular Languages: Proving Languages not to be Regular, Closure Properties of Regular Languages, Decision Properties of Regular Languages, Equivalence and Minimization of Automata.

UNIT III: Context Free Grammars and Languages: Context-Free Grammars, Parse Trees, Applications, Ambiguity in Grammars and Languages
Properties of Context Free Languages: Normal Forms for Context-Free Grammars, Pumping Lemma, Closure Properties, Decision Properties of CFL's.

UNIT IV: Pushdown Automata: Definition, Language of PDA, Equivalence of PDA's and; CFG's, Deterministic Pushdown Automata.

UNIT V: Turning Machines: Problems that Computer Cannot Solve ,The Turning Machine, Programming Techniques for Turning Machines, Extensions to the Turning Machines, Restricted Turning Machines, Turning Machine and Computers. Undecidable Problems about Turning Machines, Post's Correspondence Problem, Other Undecidable Problems.

Suggested Reading:

1. John E.Hopcroft, Rajeev Motwani,Jeffery D Ulman. Introduction to Automata Theory Languages And Computation, third edition, Pearson Education, 2009.
2. John C.Martin, Introduction to Languages and the Theory of computation ,third Edition, Tata McGrawHill,2003.

PC 505 IT COMPUTER NETWORKS

Instruction	**(3L + 1T) Periods per week**
Duration of University Examination	**3 Hours**
University Examination	**70 Marks**
Sessional	**30 Marks**

Course Objective:

1. To study the design issues in network layer and various routing algorithms
2. To introduce internet routing architecture and protocols
3. To learn the flow control and congestion control algorithms in Transport Layer
4. To introduce the TCP/IP suite of protocols and the networked applications supported by it
5. To learn basic and advanced socket system calls

UNIT – I: Introduction: Uses of Computer Networks, Network Hardware, Network Software: Reference Models (ISO - OSI, TCP/IP). Network Layer: Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Quality of Service.

UNIT – II: Internetworking: Concatenated virtual circuits, Connectionless internetworking, Tunneling, Internetwork routing, Fragmentation. Network layer in the Internet: IP protocol, IP addresses, Internet control protocols, OSPF, BGP, Internet Multicasting, Mobile IP, IPv6. Transport Layer: The Transport Service, Elements of Transport Protocols, The Internet Transport Protocols: UDP, Internet Transport Protocols: TCP.

UNIT – III: Network Programming: Socket Interface: Sockets, Socket Address, Elementary Sockets, Advanced Sockets, Socket Options, Out of Band Data, Daemon process and Internet SuperServer,IPv4 and IPv6 interoperability. Remote Procedure Calls: Introduction, Transparency Issues and Sun RPC.

UNIT - IV: **Application Layer:** Domain Name System: DNSName Space, Resource Records, Name Servers. E**lectronic Mail:** Architecture and Services, User Agent, Message Formats, Message transfer and Final Delivery. **World Wide Web:** Architectural Overview, Static Web Documents, Dynamic Web Documents, HTTP, Wireless Web. **Multimedia:** Digital Audio, Streaming Audio, Voice over IP, Video on Demand.

UNIT – V:**Network Security:** Cryptography, Symmetric Key Algorithms, Public Key Algorithms, Digital Signatures, Management of Public Keys, Communication Security, Authentication Protocols, Email Security, Web Security.

Suggested Reading:

1. Andrew S. Tanenbaurn, Computer Nerworks, Fourth Edition, Pearson Education.
2. W. Richard stevens, Unix Network Programming" Prentice Hall/Pearson Education,2009.
3. James F. Kurose, Keith W, Ross, Computer Networking, Atop-Down Approach Featuring the Internet, Third Edition, Pearson Education , 2005.
4. William Stallings, Computer Networking with Internet Protocols and Technology, Pearson Education,200

PC 531 ITCN/OS Lab

Instruction	**2 Periods per week**
Duration of University Examination	**3 Hours**
University Examination	**50 Marks**
Sessional	**25 Marks**

Course Objective:

1. To understand the usage of various Linux commands
2. To implement client server programs using TCP, UDP and Raw sockets
3. To simulate and compare performance of various protocols
4. To gain experience in shell programming
5. To implement various page replacement, CPU scheduling algorithms
6. To understand and implement semaphores and Dead lock avoidance

CN LAB

1. Basics of UNIX commands.
2. Programs using TCP Sockets (like date and time server & client, echo server & client, etc.)
3. Programs using UDP Sockets (like simple DNS)
4. Programs using Raw sockets (like packet capturing and filtering)
5. Programs using RPC
6. Simulation of sliding window protocols
7. Using Network Simulator perform the following experiments.
   a. Performance comparison of MAC protocols
   b. Performance comparison of routing protocols
   c. Study of TCP/UDP performance

d. OS LAB

1. Shell programming
2. Implement the following CPU scheduling algorithms.
   a) Round Robin b) SJF c) FCFS d) Priority
3. Implement various file allocation strategies.
4. Implement Semaphores.
5. Implement Bankers algorithm for Dead Lock Avoidance
6. Implement various page replacement algorithms

PC 532 ITDATABASE LAB

Instruction	**2 Periods per week**
Duration of University Examination	**3 Hours**
University Examination	**50 Marks**
Sessional	**25 Marks**

Course Objective:

1. To practice various DDL commands in SQL
2. To write simple and Complex queries in SQL
3. To familiarize PL/SQL

DBMS LAB

1. Creation of database (exercising the commands for creation)
2. Simple condition query creation using SQL Plus
3. Complex condition query creation using SQL Plus
4. Usage of Triggers and Stored Procedures.
5. Creation of Forms for student Information, library information, Pay roll etc.
6. Writing PL/SQL procedures for data validation
7. Generation using SQL reports
8. Creating Password and Security features for applications.
9. Usage of File locking table locking, facilities in applications.
10. Creation of small full pledged database application spreading over to 3 sessions.

Note: - The creation of sample database for the purpose of the experiments is expected to be pre-decided by the instructor.

Suggested Reading:

NileshShah , Database System Using Oracle, PHI, 2007.

1. Rick F Vander Lans, Introduction to SQL, Fourth edition, Pearson Education,2007.
2. Benjamin Rosenzweig, Elena Silvestrova, Oracle PL/SQL by Example, Third edition, Pearson Education, 2004.
3. Albert Lulushi, Oracle Forms **Developer's Handbook, Pearson Education, 2006.**

PW 533 IT MINI PROJECT - III

Instruction	**2 Periods per week**
Duration of University Examination	**3 Hours**
University Examination	**50 Marks**
Sessional	**25 Marks**

Course Objectives:

1. To develop capability to analyse and solve real world problems with an emphasis on applying/integrating knowledge acquired.
2. To take responsibility of the end product.

The Students are required to take one of larger projects listed in the suggested readings or assigned by the teacher, implement and submit the report. The workbooks and project reports should be evaluated.

PE 511 IT ARTIFICIAL INTELLIGENCE

Instruction:	**(3L) hrs per week**
Duration of SEE :	**3 hours**
CIE:	**30 Marks**
SEE:	**70 Marks**

COURSE OBJECTIVES:

1. To understand knowledge representation and logical reasoning techniques used in Artificial Intelligence.
2. To learn problem solving techniques and build expert systems.
3. To design neural network systems

Unit-I: Introduction: History of AI, Intelligent Systems, Foundations of AI, Subareas of AI, Applications. **Problem Solving – State-Space Search and Control strategies:** Introduction, General Problem Solving,Characteristics of Problem, Exhaustive Searches, Heuristic Search Techniques.

Unit-II: Logic Concepts and Logic Programming: Introduction, Propositional Calculus, Propositional Logic, Semantic Tableau System in Propositional Logic, Resolution Refutation in Propositional Logic, Predicate Logic.

Unit-III: Expert System and Applications: Introduction, Phases in Building Expert Systems, Expert SystemArchitecture, Expert Systems vs Traditional Systems, Application of Expert Systems.

Uncertainty Measure- Probability Theory: Introduction, Bayesian Belief Networks,Certainty Factor Theory, Dempster-Shafer Theory

Unit-IV:Artificial Neural Networks: Introduction, Biological Neuron, Biological and Artificial Neuron Models, Characteristics of ANN,ANN Architecture, Single-Layer Feed-Forward Networks, Training Algorithms: Discrete and Continuous Perceptron Networks, Limitations of the Perceptron Model, Multi-Layer Feed-Forward Networks.

Unit-V:Knowledge Representation: Introduction, Approaches to Knowledge Representation, KnowledgeRepresentation using Semantic Network, Knowledge representation using Frames

Suggested Reading:

1.Saroj Kaushik, Artificial Intelligence, Cengage Learning, 2011.

2.Russell, Norvig, Artificial Intelligence, A Modern Approach, Pearson Education, Second Edition, 2004.

3.Rich, Knight, Nair: Artificial Intelligence, Tata McGraw Hill, Third Edition 2009

4.NilsJ Nilsson (1998), Artificial Intelligence, A NewSynthesis. Elsevier.

5. LaureneFausett, "Fundamentals of Neural Networks", Pearson Education, 2004.

6. Simon Haykin, "Neural Networks- A comprehensive foundation", Pearson Education, 2003.

PE 512 IT COMPUTER GRAPHICS

Instruction: **(3L) hrs per week**
Duration of SEE : **3 hours**
CIE: **30 Marks**
SEE: **70 Marks**

COURSE OBJECTIVES:

1. Acquire knowledge about device level algorithms for displaying two dimensional output primitives for raster graphics system.
2. Acquire knowledge about the basic concepts of representing 3D objects in 2D.
3. To introduce computer graphics techniques transformations, clipping, curves and surfaces.

UNIT-I Overview of Graphics Systems-Video display devices, raster-scansystems, Random-scan system, graphics monitors and workstations, InputDevices, hard copy devices, Graphics Software. Output Primitives, Line driving, algorithms, Circle generating algorithms, ellipse generating algorithms, pixel addressing, Filled-area primitives, Fill area functions, cell array, character generation.

UNIT-II Attributes of output primitives:Line attributes, curve attributes, color and Gray scale level, Area fill attributes, character attributes, Bundled attributes, Enquiry function. Two dimensional Geometric transformations:Basic transformations, Homogeneous coordinates, composite transformations, other transformations, transformations between coordinate systems, affine transformations, transformation functions, Raster methods for transformations.

UNIT-III Two dimensional viewing: Viewing pipeline, viewing transformation, viewing functions, line clipping-Cohen Sutherland line clippingLiangBarskyline clipping. Sutherland-Hodgmanpolygon clipping, Weller Atherton polygon clipping.

UNIT-IV Structures and Hierarchical Modeling: Structure concepts, editing structures, Basic modeling concepts, hierarchical modeling with structures. Graphical user interfaces and Interactive input methods:The user Dialogue, logical classification of input devices, input functions and Models, Interactive picture construction techniques.

UNIT-V Three dimensional object representations: Polygon surface, curved linesand surfaces,splinerepresentations,Bezeircurvesandsurfaces, B-splinecurvesandsurfaces, CSG methods:Octress, BSP Trees. Three Dimensional Transformation Three dimensional viewing: Viewingcoordinates,projections, visible surfacedetection methods :Back- face Detections, Depth-buffer methods,depth sorting methods,Gourand shading,Phongshading.

Suggested Reading:

1.HeamDonald, PaulineBakerM.,"Computer Graphics",2nd edition, PHI,1995.
2.HaningtonS.,"ComputerGraphicsAProgramming Approach",2nd edition,McGraw Hill.
3.David F. Rogers.,"Procedural ElementsforComputerGraphics",2nd edition,TataMcGraw Hill, 2001.

PE 513 IT MULTIMEDIA TECHNOLOGIES

Instruction: **(3L) hrs per week**
Duration of SEE : **3 hours**
CIE: **30 Marks**
SEE: **70 Marks**

Course Objective:

UNIT – I: Introduction to Multimedia: What is Multimedia, Multimedia and hypermedia, World Wide Web, Overview of Multimedia software Tools. Multimedia Authorizing and Tools, Multimedia Authoring, Some Useful Editing and Authoring Tools, VRML

UNIT – II: Graphics and Image Data Representation: Graphics/image data types, Popular File Formats, Color in image and Video and Color Science, color Models in Images, Color Models in Video

UNIT – III: Fundamental Concepts in Video and audio: Types of Video signals, Analog Video, Digital Video, Digitization of sound, Musical instrument Digital interface (MIDI), quantization and transmission of Audio

UNIT – IV: Multimedia Data Compression: Lossless Compression Algorithms, lossy Compression Algorithms, Image Compression Standards, The JPEG2000 Standard, Basic Video Compression Techniques, MPEG Video coding I— MPEG –I and 2, Basic Audio Compression techniques.

UNIT – V: Multimedia communication and Retrieval: Multimedia Network Communications and Applications, Wireless Networks, Content Based Retrieval in Digital Libraries

Suggested Reading:

1.Ze-Nian Li & Mark S. Drew. *Fundamentals of Multimedia.*. Upper Saddle River, NJ: Pearson Education.
2.Multimedia Communications: Applications, Networks, Protocols and Standards, Fred Halsall, Pearson Education, 2001, rp 2005.

3.Principles of Multimedia, Ranjan Parekh, TMH, 2006.

4.Multimedia Making it work, Tay Vaughan, 7th edition, TMH, 2008.

5. Introduction to multimedia communications and Applications,Middleware, Networks, K.R.Rao, Zoran, Dragored, Wiley India, 2006, rp. 2009.