Kalinga University Atal Nagar (C.G.)

SCHEME OF EXAMINATION

& SYLLABUS

Of

M.Tech
Computer Science
(Multimedia Technology)

UNDER

Faculty of Engineering and Technology

w.e.f. Session 2021-22

Kalinga University, Raipur
M.Tech Computer Science (Multimedia Technology) (2 yrs Programme)
w.e.f 2021-21 Session

Code No.	Paper	Credits	End Semester Exam	Internal Marks	Total Marks
Semester –I					
MEMT101	Data Structures and Algorithms	4	100	50	150
MEMT102	Computer Graphics	4	100	50	150
MEMT103	Multimedia Security	4	100	50	150
MEMT104	Fundamentals of creative Multimedia	4	100	50	150
	Elective – I	4	100	50	150
MEMT105A	Computer Modeling and Animation				
MEMT105B	Virtual Reality				
MEMT106-P	Data Structures and Algorithms lab	1	30	20	50
MEMT107-P	Computer Graphics Lab	1	30	20	50
	Total	**22**	**560**	**290**	**850**
Semester – II					
MEMT201	Object Oriented Software Engineering	4	100	50	150
MEMT202	Knowledge Management	4	100	50	150
MEMT203	Electronic Commerce	4	100	50	150
MEMT204	Digital Audio and Computer music	4	100	50	150
	Elective – II	4	100	50	150
MEMT205A	Artificial Intelligence Planning				
MEMT205B	Cloud Computing				
MEMT206-P	Object Oriented Software Engineering lab	1	30	20	50
MEMT207-P	Multimedia Lab	1	30	20	50
	Total	**22**	**560**	**290**	**850**

Semester – III					
Code No.	Paper	Credits	End Semester Exam	Internal Marks	Total Marks
MEMT301	Web Design Technology	4	100	50	150
MEMT302	Communication & Research Methodology	4	100	50	150
	Elective – III	4	100	50	150
MEMT303A	Multimedia Programming				
MEMT303B	GUI Design and Windows Programming				
MEMT304	Preliminary Work on Dissertation	9	100	50	150
MEMT305	Seminar Based on Dissertation	1	100	50	150
	Total	**22**	**500**	**250**	**750**
Semester - IV					
Code No.	Paper	Credits	End Semester Exam	Internal Marks	Total Marks
MEMT401	Dissertation	18	300	200	500
	Total	**18**	**300**	**200**	**500**

SEMESTER I

MEMT101

DATA STRUCTURES AND ALGORITHMS

UNIT I
LINEAR DATA STRUCTURES AND ALGORITHM ANALYSIS
Review of Arrays-Stacks-Queues-linked lists-Linked stacks and Linked queues-Applications- Efficiency of algorithms-Asymptotic Notations- Time complexity of an algorithm using O notation- Average- Best- and Worst Case Complexities- Analyzing Recursive Programs.

UNIT II
NON LINEAR DATA STRUCTURES AND HASH TABLE
Introduction- Definition and Basic terminologies of trees and binary trees-Representation of trees and Binary trees- Binary tree Traversals- Threaded binary trees- Graphs- basic concepts –- representation and traversals. Introduction- Binary Search Trees: Definition- Operations and applications. AVL Trees: Definition- Operations and applications. B Trees: Definition-Operations and applications. Red – Black Trees- Splay Trees and its applications. Hash Tables: Introduction- Hash Tables- Hash Functions and its applications.

UNIT III
DIVIDE & CONQUER METHOD AND GREEDY METHOD
Divide and Conquer Method: General Method – binary search – finding maximum and minimum – merge sort and quick sort – Stassen's Matrix multiplication. Greedy Method: General method – knapsack problem – minimum cost spanning tree algorithms – single source shortest path algorithm – scheduling, optimal storage on tapes, optimal merge patterns.

UNIT IV
DYNAMIC PROGRAMMING
General method – multi-stage graphs – all pair shortest path algorithm – 0/1 Knapsack and Travelling salesman problem – chained matrix multiplication – approaches using recursion – memory functions. Basic Search and Traversal technique: Techniques for binary trees and graphs – AND/OR
graphs –biconnected components – topological sorting.

UNIT V
BACKTRACKING & BRANCH AND BOUND METHOD
Back tracking and Recursive back tracking, applications of Back tracking paradigm, The general method – 8-queens problem – sum of subsets – graph coloring – Hamiltonian cycle – Knapsack problem. Branch and Bound Method: Least Cost (LC) search – the 15-puzzle problem – control abstractions for LCSearch – Bounding – FIFO Branch-and-Bound - 0/1 Knapsack problem – travelling salesman problem.

Reference Books
1. Mark Allen Weiss, " Data Structures and Problem Solving using C++", The Benjamin Cummings Addison Wesley Publishing Company, 2002.
2. G.A.V. Pai , " Data Structures and Algorithms", TMH, 2009.
3. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran" Fundamentals of Computer Algorithms" 2nd Edition, University Press.
4. D. Samanta " Classic Data Structures", PHI, 2005.
5. Aho, Hopcraft, Ullman, " Design and Analysis of Computer Algorithms", PEA, 1998.
6. Goodman and Hedetniemi, " Introduction to the Design and Analysis of Algorithms", TMG.
7. E. Horowitz, S. Sahani, " Design and Analysis of Algorithms" , 3rd Edition, Galgotia.
8. Drozdek, " Data Structures and Algorithms in C++", 2nd Edition, Thomson.

MEMT102

COMPUTER GRAPHICS

UNIT I
INTRODUCTION

Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices.
Output primitives : Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms.

UNIT II
2-D GEOMETRICAL TRANSFORMS

Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms transformations between coordinate systems. 2-D viewing: The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

UNIT III
3-D OBJECT REPRESENTATION

Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. 3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations. 3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

UNIT IV
VISIBLE SURFACE DETECTION METHODS AND ANIMATION

Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods. Computer animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications.

UNIT V
ILLUMINATION AND COLOUR MODELS

Light sources - basic illumination models – halfton e patterns and dithering techniques; Properties of light - Standard primaries and chromaticity diagram; Intuitive color concepts - RGB color model - YIQ color model - CMY color model - HSV color model - HLS color model; Color selection.

Reference Books
1. Peter Shirley, Michael Ashikhmin andSteve Marschner, " Fundamentals of Computer Graphics" , 3rd Edition, 2009.
2. Donald Hearn & M. Paulin Baker, " Computer Graphics", Pearson Education, 3nd Edition, 2003.
3. Foley J.D, Van Dam A, Feiner S. K and Hughes J. F, "Computer Graphics", Addison Wesley, 2nd Edition,1993.

Multimedia Security

UNIT I
Multimedia System Overview
Introduction to Multimedia Sytem, Multimedia Files:Image and sound file formats, features of software to read and write such files, Basics of digital audio, Basics of digital imaging ,Multimedia compression technologies and standards - VCD, DVD - MPEG-1/2/4/21.

UNIT II
Multimedia Authentication
Multimedia Authentication: Pattern, Speaker and Behavior Recognition - Speaker Recognition – Face Recognition,

UNIT III
Multimedia Forensis
Multimedia Forensics:Digital Forensics taxonomy, goals/requirements - Forensic Data Acquisition - Digital Forensics Tools -Forensics Analysis and Validation - File and Network Forensics – Techniques - Application foren sics- Email, Graphics and Multimedia Forensics.

UNIT IV
Multimedia Fingerprinting:
Multimedia Fingerprinting: Trace Traitors, Multimedia fingerprinting for tracing traitor, Steganalysis, Non-intrusive forensics, Standardization and Integration, Standardization on media security

UNIT V
Secured Multimedia and Multimedia Security Applications
Secured Multimedia: Digital Rights Management Systems, and Technical Trends - Multimedia encryption - Digital Watermarking - Security Attacks. Multimedia Security Applications:
Media Sensor Network - Voice over IP (VoIP) Security – DTH – Video Conference

Reference Books
1. Wenjun Zeng, Heather Yu and Ching – Yung Lin, " Multimedia Security technologies for Digital rights Management", Elsevier Inc 2006.
2. Chun-Shien Lu, "Multimedia Security : Steganography and Digital Watermarking techniques for Protection of Intellectual Property" , Springer Inc 2007.

Elective-I

MEMT104

Fundamentals of creative Multimedia

UNIT I
MULTIMEDIA SYSTEM DESIGN: AN INTRODUCTION
Multimedia Elements, Multimedia Applications, Multimedia System Architecture, Evolving Technologies for Multimedia Systems, Multimedia Databases

UNIT II
COMPRESSION AND DECOMPRESSION TECHNIQUES
Types of Compression, Binary Image Compression Schemes, Color, gray scale, still-video image compression, Discrete Cosine Transform, Video Image compression, MPEG Coding methodology, Audio Compression, Data and File format standards- RTF, TIFF,RIFF, MIDI, JPEG, AVI, JPEG, TWAIN Architecture.

UNIT III
MULTIMEDIA INPUT AND OUTPUT TECHNOLOGY
Key Technology Issues, Pen Input, Video and Image Display Systems, Print Output Technologies, Image Scanners, Digital Voice and Audio, Video Images and Animation, Full Motion Video.

UNIT IV
STORAGE AND RETRIEVAL TECHNOLOGIES
Magnetic Media Technology, RAID-Level-0 To 5, Optical Media, WORM optical drives, Hierarchical Storage Management, Cache Management for storage systems.

UNIT V– MULTIMEDIA APPLICATION DESIGN
Types of Multimedia systems - Virtual Reality Design - Components of Multimedia system - Distributed Application Design Issues - Multimedia Authoring and User Interface - Hypermedia Messaging - Distributed Multimedia Systems

Reference Books
1. Andleigh PK and Thakrar K, "Multimedia Systems" , Addison Wesley Longman, 1999.
2. Fred Halsall, "Multimedia Communications" , Addison Wesley, 2000.
3. Ralf Steinmetz, Klara Nahrstedt, "Multimedia, computing, communications and applications" , Prentice Hall, 1995.
4. Tay Vaughan, "Multimedia making It work" , TMH 5th Edition 2001.
5. Weixel, Fulton, Barksdale.Morse, "Multimedia Basics" , Easwar Press 2004.

MEMT105A

Computer Modeling and Animation

UNIT I
INTRODUCTION TO 3D ELEMENTS AND CREATION
Understanding coordinate system, vertex, faces and object - Concept of wireframe, surface and solid modeling- Creating primitive objects and patches- Understanding modification methods and transformation of 3D objects - Creating primitives using keyboard and dimensional control.

UNIT II
SOLID MODELING AND MATERIAL EDITOR
Creating shapes by lofting - Integrating shape and path to create complex objects - Solid modeling using Boolean Operations - Boolean parameters and sub-level modifications - Creating object using NURBS – Animation using various modifiers - Definition of materials and overview of Material Editor interface - Basic materials, color and shading - Designing basic standard materials.

UNIT III
LIGHTING
Properties of light - Natural and Artificial Lights - Creating light object; Omni lights, target spotlights and free spotlights - Setting light color - Setting the shadow properties of an object.

UNIT IV
USING CAMERAS AND RENDERING
Characteristics of cameras - Placing camera in a scene - modifying camera parameters - Understanding camera navigation buttons - Concept of rendering in 3D modeling - Render options and file output - Importance of background elements in 3D visualization - Artificial fog simulation and fog types - Volume light effects.

UNIT V
PARTICLE SYSTEMS
Uses of particle systems for realistic photo-rendering - Creating simple particle systems - Definition of Space Warp - concept and application - Space warp that affects particles or geometry.

Reference Books
1. Boardman, Ted, "3DS MAX Fundamentals" , Pearson Custom Publishing, 2006.
2. "Inside 3D Studio Max Vol. II", Indianapolis, New Riders, 1997.

MEMT105B

Virtual Reality

UNIT I
INTRODUCTION TO VIRTUAL REALITY
Definition-The history of VR-Key elements- VR terminology -Types of VR technology -VR and its relation to humans-Components of VR system-Interface to Virtual World –Input and output.

UNIT II
RENDERING THE VIRTUAL WORLD
Representation of virtual world- Rendering systems- Modeling- Visual Rendering

UNIT III
INTERACTING WITH VIRTUAL WORLD
Human factors in VR- Manipulating –Navigating- interacting in virtual world- virtual reality experience – Applications

UNIT IV
VRML INTRODUCTION AND CONCEPTS
Design Goals-History-VRML & WWW; Key Concepts- Overview-UTF-8 syntax-Scene graph Structure- Node semantics- Field-Events-Time-Scripting-Navigation-Lighting

UNIT V
VRML MODELS
Node Reference-Field and Event reference-Conformance-Examples

Reference Books
1. Burdea G. C., Coiffet P., " Virtual Reality Technology", J. Wiley & Sons, Second Ed., 2003.
2. William R. Sherman and Alan Craig, " Understanding Virtual Reality: Interface, Application, and Design" Morgan Kaufmann Publishers.
3. Rikk Carey and Gavin Bell, " The Annotated VRML 2.0 Reference Manual", Addison-Wesley.
4. John Vince, " Virtual Reality Systems", Pearson Education.

Data Structures and Algorithms lab

• Program to represent sparse matrix manipulation using arrays.
• Program to represent Singly Linked List.
• Program to represent Doubly Linked List.
• Program to represent Circular Linked List.
• Polynomial addition using Arrays and Linked List.
• Program to represent Stack operations using array and linked list
• Program to represent Queue operations using array and linked list
• Program for Conversion of infix to postfix.
• Program for Evaluation of Expressions.
• Program to represent Binary Tree Traversals.
• Program to represent Searching procedures (Linear search , Binary search and Interpolation search)
• Program to represent sorting procedures (Selection , Bubble , Insertion ,Quick , Heap , Merge)
• Program to find the minimum cost spanning tree using Prim's Method.
• Program to implement 8-Queens Problem.

Computer Graphics Lab

1. Write a program for 2D line drawing as Raster Graphics Display.
2. Write a program for circle drawing as Raster Graphics Display.
3. Write a program for polygon filling as Raster Graphics Display
4. Write a program for line clipping.
5. Write a program for polygon clipping.
6. Write a program for displaying 3D objects as 2D display using perspective
7. Transformation.
8. Write a program for rotation of a 3D object about arbitrary axis.
9. **Write a program for Hidden surface removal from a 3D object**.
10. Program to Implement DDA Line Drawing Algorithm.
11. Program to Implement Bresenham's Line.
12. Program to Implement Bresenham's Circle.
13. Program to Implement Polygon Clipping Algorithm.
14. Program to Implement Polygon Filling Algorithm
15. Program to Implement Z Buffer Algorithm
16. Program to Implement Illumination Model
17. Program to Implement 3D Translation
18. Program to Implement 2D Translation
19. Program to Implement Line Clipping
20. Program to Implement Bezier Curve

SEMESTER II

MEMT201

Object Oriented Software Engineering

UNIT I
INTRODUCTION TO SOFTWARE ENGINEERING

The Software And Software Engineering Problem, Approach And Goals Of Software Engineering. Software Processes And Models: Processes, Projects And Products, Component Software Processes, Characteristics Of A Software Process, Software Development Process, Project Management Process, Software Configuration Management Process. Models: Linear Sequential, Prototyping, Rad, Incremental, Spiral, Winwin Spiral, Concurrent Development Model.

UNIT II
MODELING WITH UML

UML Diagrams: Use Case Diagrams - Class Diagrams -Interaction Diagrams - State Machine Diagrams - Activity Diagrams. Modeling Concepts - Diagram Organization - Diagram Extension.

UNIT III
REQUIREMENTS AND ANALYSIS

Requirements Elicitation - Concepts - Activities & Managing Requirements Elicitation   Analysis: Concepts - Analysis Activities - Analysis Model.

UNIT IV
SYSTEM DESIGN

Basic Concept of Software Design, Architectural Design, Low Level Design: Modularization, Design Structure Charts, Pseudo Codes, Flow Charts, Coupling and Cohesion Measures, Design Strategies: Function Oriented Design, Object Oriented Design, Top-Down and Bottom-Up Design. Software Measurement and Metrics: Various Size Oriented Measures: Hallstead's Software Science, Function Point (FP) Based Measures, Cyclomatic Complexity Measures: Control Flow Graphs, Decomposing the System - Addressing Design Goals - Reusing Patterns - Specifying Interfaces - Mapping Models to Code.

UNIT V
AGILE DEVELOPMENT AND RATIONAL UNIFIED

PROCESS Rational Unified Process Key Features - Software Best Practices - Static Structure - Dynamic Structure **Agile Development:** Adapting to Scrum - Patterns for Adopting to Scrum - New Roles - Changed Roles - Sprints - Product Backlogs – Teamwork.

Practical

Reference Books

1. Bernd Bruegge, Alan H Dutoit, " Object-Oriented Software Engineering Using UML, Patterns, and Java", 3rd Edition, ISBN-10: 0136061257 | ISBN-13: 978-0136061250, 2010.
2. Philippe Kruchten, " The Rational Unified Process: An Introduction", 3rd Edition, ISBN-10: 0321197704 | ISBN-13: 978-0321197702.
3. Mike Cohn, " Succeeding with Agile: Software Development Using Scrum", 1st Edition, ISBN-10: 0321579364 | ISBN-13: 9780321579362. 2010.
4. Grady Booch, James Rumbaugh and Ivar Jacobson, " The Unified Modeling Language User Guide",

MEMT202

Knowledge Management

UNIT I
INTRODUCTION

Introdution: An Introduction to Knowledge Management , Nature of Knowledge, Knowledge management Solutions, From Information Management toKnowledgeManagement, Knowledge management system life cycle, Organizational Impacts of Knowledge Management.

UNIT II

TECHNOLOGIES TO MANAGE KNOWLEDGE

Artificial Intelligence, Knowledge Based Systems, Case Based Reasoning Systems, Knowledge Elicitation: Converting Tacit Knowledge to Explicit Knowledge, Knowledge discovery through data mining.

UNIT III –
KNOWLEDGE MANAGEMENT SYSTEMS

Knowledge Discovery Systems-Systems that create knowledge, Knowledge Capturing Systems-Systems that preserve and formalize knowledge, Capturing Tacit Knowledge, Knowledge Sharing Systems-Systems that organizes and distribute knowledge and Knowledge Application Systems-Systems that utilize knowledge.

UNIT IV
KNOWLEDGE CODIFICATION AND SYSTEM IMPLEMENTATION

Modes of Knowledge Conversion, Knowledge Codification, Codification tools and procedures, Implications for knowledge management, Knowledge Transfer and sharing – Role of Internet in knowledge Transfer

UNIT V
FUTURE TRENDS AND CASE STUDIES

The future of knowledge management, Advanced topics and case studies in knowledge management-Development of a Knowledge management map/plan that is integrated with an organization's strategic and business plan - A case study on Corporate Memories for supporting various aspects in the process life -cycles of an organization.

 Reference Books
 1. Irma Becerra-Fernandez, Avelino Gonzalez, Rajiv Sabherwal "Knowledge Management Challenges, Solutions, and Te chnologies" (edition with accompanying CD). Prentice Hall. ISBN: 0-13-109931-0, 2004.
 2. Elias M. Awad, Hassan M. Ghaziri, " Knowledge Management", Prentice Hall. ISBN: 0-13-034820-1, 2004.
 3. Imed Boughzala and Jean-Louis Ermine, " Trends In Enterprise Knowledge Management", International Scientific and Technical Encyclopedia © 2006 Citation, ISBN:9781905209033.
 4. Anthony F. Buono and Flemming Poulfelt, " Challenges and Issues in Knowledge Management", Information Age Publishing © 2005 Citation, ISBN:9781593114190.

MEMT203

Electronic Commerce

UNIT I
INTRODUCTION
Introduction to E-commerce: E-commerce business models-Roles of E-commerce, trends in E-commerce - Current Web technologies for E-commerce-Social E-commerce and Mobile E-commerce- E-commerce current and future scope-E-commerce market.

UNIT II
BUILDING E-COMMERCE SYSTEMS
Building E-commerce systems –software for E-commerc e systems-Hardware for E-commerce systems-Scalability–E-commerce web s ystem development life cycle-HCI for E-commerce: User experience design-Designing E-commerce for Mobile systems - Cloud services and computing in E-commerce

UNIT III
E-COMMERCE SOFTWARES
Multi tier architecture –web server software-Applic ation server software-database software-Dynamic web page programming languages-MVC Frameworks-E-commerce system tools and personalization tools – web site management tools-Intelligent Agents

UNIT IV
PAYMENT AND E-COMMERCE SECURITY
Electronic payment systems: Credit cards –Debit car ds -online transactions. Security Threats in E-commerce: vulnerability in client side, server side and in communication medium-Technology and solutions: Encryption, SSL VPN, firewalls-server and client side protection. SET: Key Technologies in Secure Electronic Transactions

UNIT V
E-COMMERCE MARKETING, LAWS, POLICIES AND ETHICS
Marketing and promotion of e-business -E-commerce security policy, Laws and Cyber Forensics an overview-Ethics in E-commerce

Reference Books
1. Janice Reynolds, "The Complete E-Commerce Book: Design, Build and maintain a successful Web-based Business" CRC Press; 2 edition,2nd
   Edition, MP Books, 2004.
2. Paul Todd, " E Commerce Law" Cavendish Publishing company, 2005.

MEMT204

Digital Audio and Computer music

UNIT I
INTRODUCTION
Digital audio, audio processing- handling audio in MATLAB-segmentation-visualization-sound generation-Speech: production-characteristics of speech, speech understanding

UNIT II
HEARING, COMMUNICATION AND AUDIO ANALYSIS
Psychoacoustics-Amplitude and frequency models-auditory scene analysis-speech communication- quantization - parameterization-audio analysis - analysis toolkit –speech analysis and classification

UNIT III
DIGITAL AUDIO
Introduction to audio files in Reason-digital audio concepts-formants-pitch correction -Digital audio technology-digital audio workstation-Groove tools and techniques.

UNIT IV
MIDI AND AUDIO IN WEB
Introduction to MIDI and its recording- MIDI hardware setups; MIDI messages; MIDI editing-electronic music technology- multimedia and the web-synchronization-amplifiers.

UNIT V
SIGNAL PROCESSING
Signal processing-Noise reduction- Surround sound- Transforms in signal processing, Z-Transform, Discrete Time Fourier Transform (DTFT), Discrete Fourier Transform (DFT), Discrete Cosine Transform (DCT), Short Time Fourier Transform (STFT).

Reference Books
1. Ian McLoughlin, "Applied Speech and Audio Processing with MATLAB® Example", Cambridge University Press (ISBN-13 : 978-0-521-13283-1) 2009.
2. David Miles Huber and Robert E. Runstein, " Modern Recording Techniques-7th Edition" , Focal Press(ISBN: 978-0-240-81069-0), 2009.
3. Francis Rumsey and Tim McCormick, " Sound and Recording-6th Edition" , Focal Press (ISBN: 978-0-24-052163-3), 2009.
4. Michael Talbot and Smith, " Sound Engineering Explained, 2/e" , Focal Press (Original ISBN:0-240-51667-2, Indian Reprint ISBN-13: 978-81-312-0820-5), 2001.

Elective-II

MEMT205A

Artificial Intelligence Planning

UNIT I
INTRODUCTION AND PLANNING IN CONTEXT
Introduction to planning-Conceptual model for planning-Representations for classical planning-Complexity of classical planning

UNIT II
STATE-SPACE SEARCH
Heuristic Search and STRIPS-State-Space Planning-The STRIPS algorithm-Domain-Specific State Space Planning.

UNIT III
PLAN-SPACE SEARCH AND HTN PLANNING
The Search-Space of Partial Plans-Solution Plans-Algorithms for Plan-Space Planning-Plan-Space versus State-Space Planning-HTN (Hierarchical Task Network) Planning.

UNIT IV
GRAPH PLAN AND ADVANCED HEURISTICS
Planning Graphs-The GraphPlan Planner-Constraint Satisfaction Techniques-Heuristics in Planning

UNIT V
PLAN EXECUTION AND APPLICATIONS
Planning with Time and Resources-Time for Planning-Temporal Planning-Planning and Resource Scheduling-Case Studies and Applications

Reference Books
1. M. Ghallab, D. Nau, and P. Traverso, " Automated Planning: Theory & Practice (The Morgan Kaufmann Series in Artificial Intelligence" , Elsevier, ISBN 1-55860-856-72004, 2004
2. Stuart Russell, Peter Norvig, " Artificial Intelligence: A Modern Approach", 3 rd Edition, ISBN-10: 0136042597, ISBN-13: 978-0136042594, 2009.

Cloud Computing

UNIT I
CLOUD COMPUTING BASICS
Cloud computing components- Infrastructure-services- storage applications-database services – Deployment models of Cloud- Services offered by Cloud-Benefits and Limitations of Cloud Computing – Issue s in Cloud security-Cloud security services and design principles

UNIT II
VIRTUALIZATION FUNDAMENTALS
Virtualization – Enabling technology for cloud comp uting- Types of Virtualization- Server Virtualization-Desktop Virtualization – Memory Virtualization – Application and Storage Virtualiza tion- Tools and Products available for Virtualization

UNIT III
Cloud Architecture- Layers and Models
Layers in cloud architecture, Software as a Service (SaaS), features of SaaS and benefits, Platform as a Service (PaaS), features of PaaS and benefits, Infrastructure as a Service (IaaS), features of IaaS and benefits, Service providers, challenges and risks in cloud adoption. Cloud deployment model: Public clouds – Private clouds – Community clouds - Hybrid clouds

UNIT IV
IAAS AND CLOUD DATA STORAGE
Understanding IaaS- Improving performance through Load balancing- Server Types within IaaS solutions-Utilizing cloud based NAS devices – Understanding Cloud based data storage- Cloud based backup devices-Cloud based database solutions- Cloud based block storage

UNIT V
CLOUD APPLICATION DEVELOPMENT
Client Server Distributed Architecture for cloud – Traditional apps vs. Cloud apps – Client side programming model: Web clients. Mobile clients- Server Side Programming Technologies : AJAX, JSON, Web Services (RPC, REST)- MVC Design Patterns for Cloud Application Development

Reference Books
1. Anthony T .Velte, Toby J.Velte, Robert Elsenpeter, " Cloud Computing: A Practical Approach", Tata McGraw Hill Edition, Fourth Reprint, 2010
2. Kris Jamsa, " Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security and more", Jones & Bartlett Learning Company LLC, 2013
3. Ronald L.Krutz, Russell vines, " Cloud Security: A Comprehensive Guide to Secure Cloud Computing", Wiley Publishing Inc., 2010.

Object Oriented Software Engineering lab

1. Simple C++ Programs to Implement Various Control Structures.
   a. If statement
   b. Switch case statement and do while loop
   c. For loop
   d. While loop

2. Programs to Understand Structure & Unions.
   a. Structure
   b. union

3. Programs to Understand Pointer Arithmetic.

4. Functions & Recursion.
   a. Recursion
   b. function

5. Inline Functions.

6. Programs to Understand Different Function Call Mechanism.
   a. Call by reference & Call by Value

7. Programs to Understand Storage Specifiers.

8. Constructors & Destructors.

9. Use of "this" Pointer. Using class

10. Programs to Implement Inheritance and Function Overriding.
    a. Multiple inheritance –Access Specifiers
    b. Hierarchical inheritance – Function Overriding /Virtual Function

11. Programs to Overload Unary & Binary Operators as Member Function & Non Member Function.
    a. Unary operator as member function
    b. Binary operator as non member function

12. Programs to Understand Friend Function & Friend Class.
    a. Friend Function
    b. Friend class

13. Programs on Class Templates

Multimedia Lab

SEMESTER-III

MEMT301

Web Design Technology

UNIT I
Web Essentials, HTML5, CSS3 Web Essentials: Clients, Servers and Communications. The Internet-Basic Protocols-The World Wide Web-Http request message-response message-Web Clients and Web Servers.**HTML5:** Basic Tags-Canvas, SVG, Drag/Drop, Geolocation, Video, Audio, Input types-Form elements, form Attributes.**CSS3:** Borders-Backgrounds-TextEffects-Fonts-2D and 3D Transforms-Transitions-Animations

UNIT II
JAVASCRIPT and JQUERY JavaScript: An Introduction to JavaScript -Objects in JavaScript: Data and Objects - Built-in objects - Events - DHTML with JavaScript. **jQuery**:Selectors, Events-jQuery Effects: Hide/Show, Fade ,Animate, stop, callback, chaining-jQuery DOM manipulation

UNIT III
SERVLETS AND JSP Servlets 3.1: Web servers and Java web containers-Lifecycle-content handling-cookies-session tracking-filters- Annotations- Filters-Event handling-Exception Handling -Asynchronous processing - Debugging - Security – Internationalization **. Java server pages(JSP) 2.2**:Expressions-and declarations-directives-JSP and java beans-include and forward directives-- Standard Tag Library- Database Access- XML - Java Beans - Custom Tags - Expression Language(EL)-JSTL.

UNIT IV
XML XML: Introduction and Overview-XML Fundamentals-XML Syntax-XML Namespaces-XML Document Type Definitions (DTD)-XML Schema Definition (XSD)-XQuery and Xpath-Presenting XML-XML Transformation with XSLT-XML Parsers:DOM and SAX

UNIT V
AJAX AJAX-xmlHttpRequest object-AJAX applications-AJAX frame work .**Web design Frameworks**: Responsive web design-Overview on Twitter bootstrap, DoJo, YahooUI, Google web toolkit libraries. **Applets**-Overview on javaFX applets.

Reference Books
1. Jeffrey C. Jackson, "Web Technologies: A Computer Science Perspective", Pearson Education, 2006.
2. Chris Bates, " Web Programming – Building Intranet applications" , Wiley Publications, 3rd Edition, 2009.
3. Jonathan Chaffer, Karl Swedberg, " Learning jQuery: Better interaction Design and Web Development with Simple JavaScript Techniques", PACKT publishing, 2007.
4. Deitel, Deitel & Nieto, " Internet and World Wide Web - How to Program" , Prentice Hall, 4th Edition, 2008.
5. Marty Hall,"Core Servlets and Java Server Pages" , JAVA 2 Platform, Enterprise Edition services. www.w3schools.com

MEMT302

Communication & Research Methodology

Unit I
Concepts of Communications: Definition, Forms of Communication, Objectives of Communication, Characteristics of Communication, Process of Communication, Communication, Roadblocks, Role of Verbal and Non-verbal Symbols in Communication, Barriers to Effective Communication, Overcoming Communication Barriers.
Nonverbal communication: Body Language, Gestures, Postures, Facial Expressions, Dress codes; the Cross Cultural Dimensions of Business Communication; Listening and Speaking, techniques of electing response, probing questions, Observation. Business and social etiquettes;
Listening Skills: Definition, Anatomy of poor Listening, Features of a good Listener, Role Play, Group Discussion and Interviews, Meetings: Ways and Means of conducting meetings effectively, Mock Meetings and Interviews

Unit II
Reading and language skills: The reading process, purpose, different kinds of texts, reference material, scientific and technical texts, active and passive reading, strategies - vocabulary skills, eye reading and visual perception, prediction techniques, scanning skills, distinguishing facts and opinions, drawing inferences and conclusions, comprehension of technical material - scientific and technical texts, instructions and technical manuals, graphic information.
Forms of Communication in Written mode: Basics Body language of Business Letters and Memos, Tone of writing, Enquiries, orders and replying to them, sales letters, Job applications and resume, E-mail: How to make smart e-mail, Writing Business Reports and Proposals, Practice for Writing.

Unit III
Referencing and Writing skills: Business letters: Enquiries, Circulars, Quotations, Orders, Acknowledgments, Executions, Complaints, Claims and adjustments, Collection letter, Banking correspondence, Agency correspondence, Bad news and persuading letters, Sales letters, Job application letters - Biodata, Covering Letter, Interview Letters, Letter of Reference, Memos, minutes, Circulars & notices.
Types of Business Reports - Format, Choice of vocabulary, coherence and cohesion, paragraph writing, organization reports by individual, Report by committee.

Unit IV
Introduction to Research and Research Design: Nature and scope of research, information based decision making and source of knowledge. The research process; basic approaches and terminologies used in research. Defining research question and framing of hypotheses, preparing a research plan, qualitative and quantitative research designs, Experimentation, Observational studies, Exploring secondary data.
Measurement and Scaling, Data Source and Data Collection Field research: primary data collection from observations, surveys and experimentation. Measurement and scaling; commonly used scales in reliability and validity of scales. Designing instrument for data collection; testing the instrument, data collection process, Sampling methods and procedures and sample size decisions.

Unit V
Data Analysis and Presentation Editing and coding of data, tabulation, graphic presentation of data, cross tabulation, Testing of hypotheses; type I and II errors, one tailed and two tailed tests of significance, Parametric and nonparametric tests for Univariate and Bivariate data. Tests of association; simple linear regression and other non parametric tests.
Technical Writing: Technical Proposal writing: Definition, Purpose, types, characteristics, Elements of structure, style and appearance, evaluation, exercises, Research report writing, Proposal writing, referencing, forms of reports, bibliography, etc. Research paper, Dissertation, and Thesis, Instruction Manuals, Type of instructions, Writing Instructions, Technical Descriptions, Process descriptions, Guidelines for Writing Good Descriptions.

Text Books:
1. Lesikar, R. V. & Flatley, Basic Business Communication Skills for Empowering the Internet Generation. TMH.
2. Meenakshi Raman, Sangeeta Sharma, Technical Communications, Oxford Latest Edition.
3. D. K. Bhattacharyya, Research Methodology, Excel Books 2nd Edition.

Reference Books:
1. Bowman, J.P. &Branchaw, P.P. Business Communications, Process to Product Dryden Press, Chicago.
2. M Ashraf Rizvi, Effective Technical Communication, Tata McGraw Hill.
3. E. H. McGrath, Basic Managerial Skills, Prentice hall India
4. Sajitha, Technical Writing, Himalaya Latest Edition
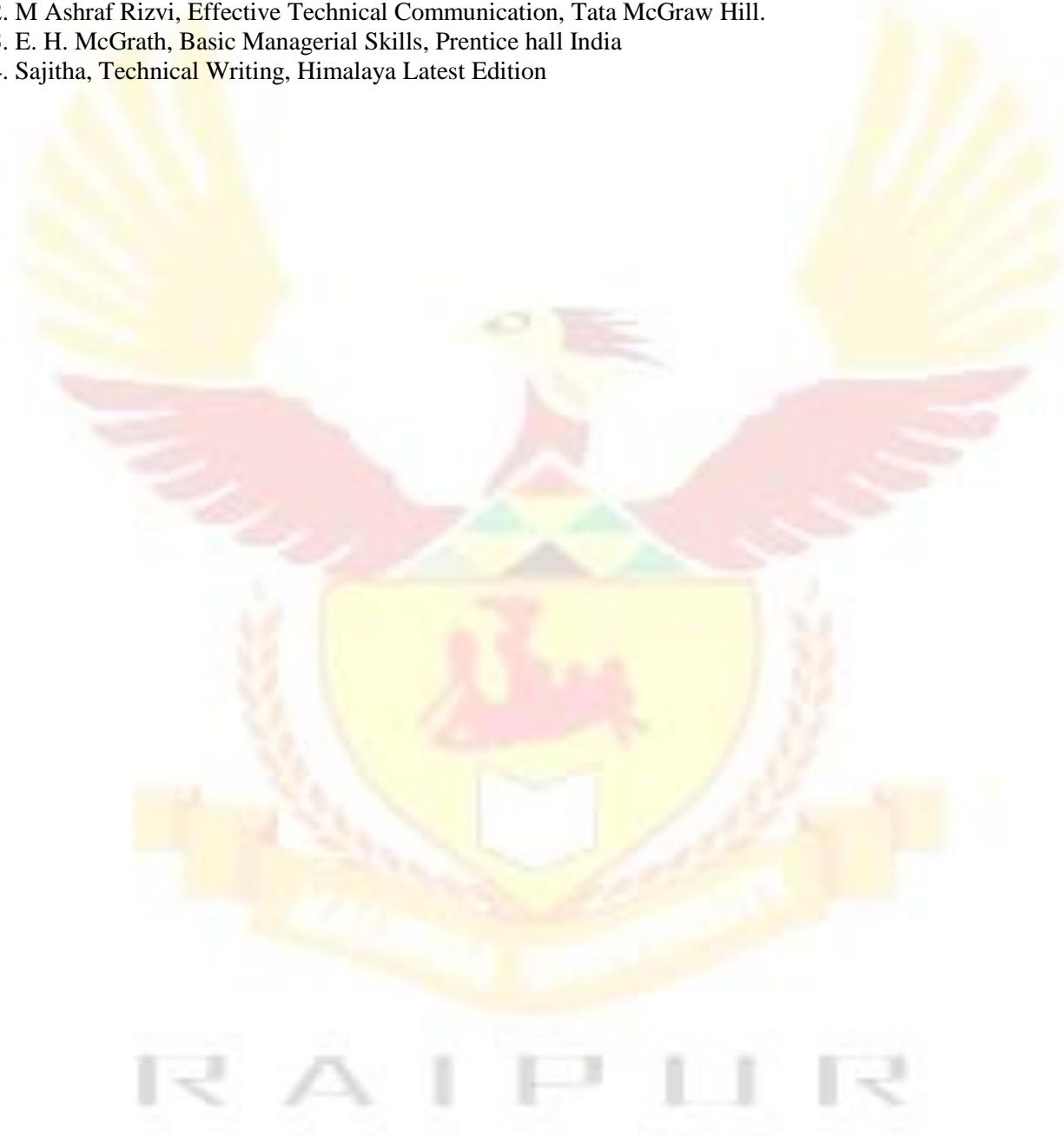
Elective-III

MEMT303A

Multimedia Programming

UNIT I
INTRODUCTION TO ACTION SCRIPT IN FLASH
Programming Concepts – Variables, Data types, condi tionals, loops, arrays, Functions, Custom objects - Properties, Methods and Events – Display List, Timeline Control.

UNIT II
ADVANCE CONCEPTS IN ACTION SCRIPT USING FLASH BUILDER
OOP –Motion –Drawing with Vectors and Pixels –Text –Sound and video – Understanding XML

UNIT III
ACTION SCRIPT IN FLEX
Setting up the environment –Using Design mode and S ource mode –Adding Interactivity –Using Data Binding –Layout –Creating Rich Forms

UNIT IV
JAVASCRIPT & PHP
JavaScript –Introduction –Variables and Data types –Control S tructures – JavaScript Objects. **PHP** –PHP language Basics –Files and directories –Data Retrieval using PHP

UNIT V
ADOBE AIR
Introduction – Applications, Windows, Menus –File S ystem Integration – Using Local databases –HTML in AIR.

Reference Books
1. Rich Shupe and Zevan Rosser, " Learning ActionScript 3.0: A Beginner's Guide ", Adobe Developer Library.
2. Chafic Kazoun and Joey Lott, " Programming Flex 3", Adobe Developer Library.
3. Alaric Cole, " Learning Flex 3", Adobe Developer Library
4. Paul Wilton and Jeremy McPeak, " Beginning JavaScript, 3rd Edition", Wrox Press Inc., 2007.
5. Mercer, Kent, Nowicki, Squier and Choi, " Beginning PHP5", John Wiley & Sons, Inc., 2004.
6. Michael Labriola, " Breaking out of Web Browser With Adobe AIR", Prentice Hall, Inc., 2009.
7. Joseph Lott, Kathryn Rotondo, Sam Ahn and Ashley Atkins, "Adobe AIR in Action", Manning Publications Co, 2009.

MEMT303B

GUI Design and Windows Programming

UNIT I
INTRODUCTION
Introduction - GUI advantages – Usability Goals and Measures – Usability Motivation –Guidelines - Principles – Comparison of GUI and web design

UNIT II
DEVELOPMENT PROCESS
Organization Design, Pillars of design -Development Methodology - Participatory Design -Scenario Development - Expert Reviews -Usability Testing –Usability reports- Usability lab- Acceptan ce Testing - Evaluation during Active Use -Practicing Examples.

UNIT III
INTERACTION STYLES
Examples of direct Manipulation - 3D Interface- Virtual and Augmented Reality Task related Menu Organization -Single Menu, Combination of Multiple Menu - Content Organization, Data Entry with Menus - Command & Natural Language - Command organization functionality, Strategies

UNIT IV
DESIGN ISSUES
Quality of Services - Models of Response – Time Imp acts -Expectation and Attitude -User Productivity and Variability in Response Time -Online versus Paper Documentation -Shaping the content and Accessing the Document - Online Tutorial - Development Process and Examples

UNIT V
INFORMATION SEARCH AND VISUALIZATION
Information Search and Visualization -Searching in Textual documents and Database Querying Multimedia Document Searches -Advanced filtering - Data type by Task Taxonomy - Challenges for Information Visualization - Practicing Examples

Reference Books
1. Shneiderman, Plaisant, Cohen & Jacobs, " *Designing the User Interface: Strategies for Human-Computer Interaction"* , 5/E, Addison-Wesley, 2009.
2. Leventhal and Barnes *, "Usability Engineering: Process, Products and Examples"* , 1/E, Prentice Hall, 2007.
3. Dix, Finlay, Abowd and Beale, " *Human-Computer Interaction"* , 3/E, Prentice Hall, 2003.

MEMT304

Preliminary Work on Dissertation

The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format. The student will have to present the progress of the work through seminars and progress reports.

MEMT305

Seminar based on Dissertation

The student will deliver a seminar on the topic chosen by him and approved by Departmental committee for evaluation at the end of semester

SEMESTER-IV

MTHE401

Dissertation

The student will submit a detailed Project Report on the topic approved by Departmental committee in a specified format and will also deliver a Presentation on the topic chosen at the end of semester.