PROGRAM EDUCATIONAL OBJECTIVES (PEOs):
1. To enable graduates to excel in multimedia technology and information technology profession by adapting to rapid advances in newer technologies.
2. To provide graduates a proper foundation in mathematical, scientific, multimedia and engineering fundamentals to solve real world problems.
3. To train graduates with good scientific, multimedia technologies and solve real time problems.

PROGRAM OUTCOMES (POs)
Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
PROGRAM SPECIFIC OBJECTIVES (PSOs)

1) To learn the basics of multimedia technologies and protocols.
2) To analyze, design and develop animation movies involving computer graphics and video analytics using advanced techniques and tools.
3) To apply media security in virtual reality video processing using IoT for multimedia applications.
4) To innovate ideas and smart solutions for game development, sound engineering and production of short films.

Provide mapping of 1) POs to PEOs and 2) PSOs to PEOs.
Use the following marking:

Contribution 1: Reasonable 2: Significant 3: Strong

MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES WITH PROGRAMME OUTCOMES

A broad relation between the programme objective and the outcomes is given in the following table

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MAPPING OF PROGRAM SPECIFIC OBJECTIVES WITH PROGRAMME OUTCOMES

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## MAPPING OF PROGRAM SPECIFIC OBJECTIVES WITH PROGRAMME OUTCOMES

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AFFILIATED INSTITUTIONS  
M.E. MULTIMEDIA TECHNOLOGY  
REGULATIONS – 2017  
CHOICE BASED CREDIT SYSTEM  
CURRICULA AND SYLLABI  

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**PROFESSIONAL ELECTIVES (PE)**

### SEMESTER II

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**SEMESTER III**

**ELECTIVE V**

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*Professional Electives are grouped according to elective number as was done previously.*

**EMPLOYABILITY ENHANCEMENT COURSES (EEC)**

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OBJECTIVES:
This course is designed to provide the solid foundation on topics in applied probability and various statistical methods which form the basis for many other areas in the mathematical sciences including statistics, modern optimization methods and risk modeling. It is framed to address the issues and the principles of estimation theory, testing of hypothesis and multivariate analysis.

UNIT I PROBABILITY AND RANDOM VARIABLES

UNIT II TWO DIMENSIONAL RANDOM VARIABLES
Joint distributions – Marginal and conditional distributions – Functions of two dimensional random variables – Regression curve – Correlation.

UNIT III ESTIMATION THEORY

UNIT IV TESTING OF HYPOTHESIS
Sampling distributions – Type I and Type II errors – Small and large samples – Tests based on Normal, t, Chi square and F distributions for testing of mean, variance and proportions – Tests for independence of attributes and goodness of fit.

UNIT V MULTIVARIATE ANALYSIS
Random vectors and matrices – Mean vectors and covariance matrices – Multivariate normal density and its properties – Principal components - Population principal components – Principal components from standardized variables

TOTAL: 60 PERIODS

OUTCOMES:
After completing this course, students should demonstrate competency in the following topics:

- Basic probability axioms and rules and the moments of discrete and continuous random variables.
- Consistency, efficiency and unbiasedness of estimators, method of maximum likelihood estimation and Central Limit Theorem.
- Use statistical tests in testing hypotheses on data.
- Perform exploratory analysis of multivariate data, such as multivariate normal density, calculating descriptive statistics, testing for multivariate normality.

The students should have the ability to use the appropriate and relevant, fundamental and applied mathematical and statistical knowledge, methodologies and modern computational tools.
REFERENCES:

CP5151 ADVANCED DATA STRUCTURES AND ALGORITHMS L T P C 4 0 0 4

OBJECTIVES:
- To understand the usage of algorithms in computing.
- To learn and use hierarchical data structures and its operations
- To learn the usage of graphs and its applications.
- To select and design data structures and algorithms that is appropriate for problems.
- To study about NP Completeness of problems.

UNIT I ROLE OF ALGORITHMS IN COMPUTING 12

UNIT II HIERARCHICAL DATA STRUCTURES 12

UNIT III GRAPHS 12

UNIT IV ALGORITHM DESIGN TECHNIQUES 12

UNIT V NP COMPLETE AND NP HARD 12

TOTAL: 60 PERIODS
OUTCOMES:
Upon the completion of the course the student should be able to
- Design data structures and algorithms to solve computing problems.
- Design algorithms using graph structure and various string matching algorithms to solve real-life problems.
- Apply suitable design strategy for problem solving

REFERENCES:

CP5152 ADVANCED COMPUTER ARCHITECTURE

OBJECTIVES:
- To introduce the students to the recent trends in the field of Computer Architecture and identify performance related parameters.
- To learn the different multiprocessor issues.
- To expose the different types of multicore architectures.
- To understand the design of the memory hierarchy.

UNIT I FUNDAMENTALS OF COMPUTER DESIGN AND ILP

UNIT II MEMORY HIERARCHY DESIGN

UNIT III MULTIPROCESSOR ISSUES
Introduction- Centralized, Symmetric and Distributed Shared Memory Architectures – Cache Coherence Issues – Performance Issues – Synchronization – Models of Memory Consistency – Case Study-Interconnection Networks – Buses, Crossbar and Multi-stage Interconnection Networks

UNIT IV MULTICORE ARCHITECTURES

UNIT V VECTOR, SIMD AND GPU ARCHITECTURES

TOTAL :45 PERIODS
OUTCOMES:
Upon completion of this course, the students should be able to:
- Identify the limitations of ILP.
- Discuss the issues related to multiprocessing and suggest solutions
- Point out the salient features of different multicore architectures and how they exploit parallelism.
- Discuss the various techniques used for optimising the cache performance
- Design hierarchal memory system
- Point out how data level parallelism is exploited in architectures

REFERENCES:

CP5153 OPERATING SYSTEM INTERNALS
OBJECTIVES:
- To be able to read and understand sample open source programs and header files.
- To learn how the processes are implemented in linux.
- To understand the implementation of the Linux file system.
- To study Linux memory management data structures and algorithms.
- To acquire the knowledge in the implementation of interprocess communication.
- To understand how program execution happens in Linux.

UNIT I INTRODUCTION

UNIT II PROCESSES
UNIT III  FILE SYSTEM  9
The Virtual File System (VFS) - Role - File Model - System Calls - Data Structures - Super Block, Inode, File, dentry Objects - dentry Cache - Files Associated with a Process - Filesystem Types - Special Filesystems - Filesystem Type Registration - Filesystem Handling - Namespaces - Mounting - Unmounting - Implementation of VFS System Calls.

UNIT IV  MEMORY MANAGEMENT  9
Page frame management - page descriptors - non-uniform memory access - memory zones - reserved page frames - zoned page frame allocator - kernel mappings - buddy system algorithm - page frame cache - zone allocator.

UNIT V  PROCESS COMMUNICATION AND PROGRAM EXECUTION  9

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:
• To explain the functionality of a large software system by reading its source.
• To revise any algorithm present in a system.
• To design a new algorithm to replace an existing one.
• To appropriately modify and use the data structures of the Linux kernel for a different software system.

REFERENCES:

CP5154  ADVANCED SOFTWARE ENGINEERING  L T P C
3 0 0 3

OBJECTIVES:
• To understand Software Engineering Lifecycle Models
• To do project management and cost estimation
• To gain knowledge of the System Analysis and Design concepts.
• To understand software testing approaches
• To be familiar with DevOps practices
UNIT I INTRODUCTION

UNIT II SOFTWARE REQUIREMENT SPECIFICATION

UNIT III ARCHITECTURE AND DESIGN

UNIT IV TESTING
Testing – Unit testing – Black box testing– White box testing – Integration and System testing – Regression testing – Debugging - Program analysis – Symbolic execution – Model Checking

UNIT V DEVOPS

TOTAL: 45 PERIODS

OUTCOMES:
At the end of this course, the students will be able to:

- Understand the advantages of various Software Development Lifecycle Models
- Gain knowledge on project management approaches as well as cost and schedule estimation strategies
- Perform formal analysis on specifications
- Use UML diagrams for analysis and design
- Architect and design using architectural styles and design patterns
- Understand software testing approaches
- Understand the advantages of DevOps practices

REFERENCES:
OBJECTIVES:
- To understand the design of databases.
- To acquire knowledge on parallel and distributed databases and its applications.
- To study the usage and applications of Object Oriented and Intelligent databases.
- To understand the emerging databases like Mobile, XML, Cloud and Big Data

UNIT I PARALLEL AND DISTRIBUTED DATABASES

UNIT II INTELLIGENT DATABASES

UNIT III XML DATABASES

UNIT IV MOBILE DATABASES

UNIT V MULTIMEDIA DATABASES

TOTAL :45 PERIODS

OUTCOMES:
Upon successful completion of this course, a student will be able to:
- To develop skills on databases to optimize their performance in practice.
- To analyze each type of databases and its necessity.
- To design faster algorithms in solving practical database problem.

REFERENCES:
OBJECTIVES:
- To acquire the knowledge of using advanced tree structures.
- To learn the usage of heap structures.
- To understand the usage of graph structures and spanning trees.

LIST OF EXPERIMENTS
Each student has to work individually on assigned lab exercises. Lab sessions could be scheduled as one contiguous four-hour session per week or two two-hour sessions per week. There will be about 15 exercises in a semester. It is recommended that all implementations are carried out in Java. If C or C++ has to be used, then the threads library will be required for concurrency. Exercises should be designed to cover the following topics:

EXPERIMENTS:
1. Implementation of Merge Sort and Quick Sort-Analysis
2. Implementation of a Binary Search Tree
3. Red-Black Tree Implementation
4. Heap Implementation
5. Fibonacci Heap Implementation
6. Graph Traversals
7. Spanning Tree Implementation
8. Shortest Path Algorithms (Dijkstra's algorithm, Bellmann Ford Algorithm)
9. Implementation of Matrix Chain Multiplication
10. Activity Selection and Huffman Coding Implementation.

TOTAL: 60 PERIODS

OUTCOMES:
Upon Completion of the course, the students will be able to:
- Design and implement basic and advanced data structures extensively.
- Design algorithms using graph structures
- Design and develop efficient algorithms with minimum complexity using design techniques.

OBJECTIVES:
The student should be able:
- To understand the concepts of DBMS.
- To familiarize with SQL queries.
- To write stored procedures in DBMS.
- To learn front end tools to integrate with databases.

EXPERIMENTS IN THE FOLLOWING TOPICS:
1. Data Definition, Manipulation of Tables and Views, Database Querying – Simple queries, Nested queries, Sub queries and Joins.
2. Triggers, Transaction Control.
3. Embedded SQL, Database Connectivity with Front End Tools High level language extensions - PL/SQL Basics, Procedures and Functions.
4. Active Databases, Deductive Databases.
5. Distributed and Parallel Transactions and Query Processing.
7. Object Oriented Database Design.
10. XML Databases and No SQL Database Storage and Retrieval.

OUTCOMES:
Upon completion of this course, the student should be able to:
- Design and Implement databases.
- Formulate complex queries using SQL.
- Design and Implement applications that have GUI and access databases for backend connectivity.

MU5251 MULTIMEDIA COMMUNICATION NETWORKS L T P C
3 0 0 3

OBJECTIVES:
- To understand the multimedia communication models
- To analyze the guaranteed service model
- To study the multimedia transport in wireless networks
- To explore real-time multimedia network applications

UNIT I MULTIMEDIA COMMUNICATION MODELS
Common Multimedia applications - VoIP- Video Conferencing- Military Surveillance- Interactive TV-
Video on Demand- Smart Phone - Requirements and Design challenges of multimedia communications-Architecture of Internet Multimedia Communication- Protocol Stack-H.323.

UNIT II BEST EFFORT AND GUARANTEED SERVICE MODEL
Best effort service model and its limitations-Resource allocation-Metrics-Max and Min fair sharing-
Queueing-FIFO-Priority queue-Fair queue-Waited fair queue-Traffic policing-Token bucket-leaky 
bucket-Admission control-Packet classification and scheduling.

UNIT III MULTIMEDIA ON IP NETWORKS
QoS aware routing-RSVP-Integrated and Differentiated services-MPLS-Multicasting-IGMP-PIM-
DVMRP

UNIT IV TRANSPORT LAYER SUPPORT FOR MULTIMEDIA
Multimedia over TCP-Significance of UDP- Multimedia Streaming- Audio and Video Streaming-
Interactive and non Interactive Multimedia-RTP/RTCP-SIP-RTSP.

UNIT V MULTIMEDIA QOS ON WIRELESS NETWORKS
IEEE 802.11e, IEEE 802.16, 3G networks-UMTS, 3GPP, 4G networks-LTE-IMS.

TOTAL: 45 PERIODS
OUTCOMES:
At the end of the course, the students will be able to:
- Deploy the right Multimedia Communication models
- Apply QoS to multimedia network applications with efficient routing techniques
- Develop the real-time multimedia network applications

REFERENCES:

MU5201  ADVANCE COMPUTER GRAPHICS AND ANIMATION  L T P C
3 0 0 3

OBJECTIVES:
- To understand the basics of geometry processing.
- To understand the fundamentals of pipelined rasterization rendering of meshed objects and curved surfaces.
- To understand and work with advanced rendering methods such as radiosity.
- To design programs for advanced animation methods
- To become proficient at graphics programming using OpenGL

UNIT I  INTRODUCTION

UNIT II  TRANSFORMATIONS
Affine Transformations (2D & 3D): Translation, Rotation, Scaling, Reflection and Shearing; Hierarchical Modeling & viewing: The Camera Transformation – Perspective, orthographic and Stereographic views;

UNIT III  FRACTALS
Fractals and Self similarity – Peano curves – Creating image by iterated functions – Mandelbrot sets – Julia Sets – Random Fractals – Overview of Ray Tracing – Intersecting rays with other primitives – Reflections and Transparency – Boolean operations on Objects - its applications

UNIT IV  ADVANCED RENDERING TECHNIQUE
Curves and Surfaces: Bezier, B-Splines and NURBS; Color models; Photorealistic rendering; Global Illumination; Ray tracing; Monte Carlo algorithm; Adding Surface texture- Texture Synthesis – Bump Mapping, Environmental mapping; Advanced Lighting and Shading,
UNIT V ANIMATION

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the student will:
- Analyze the fundamentals of 2D and 3D computer graphics.
- Discuss the basic algorithms commonly used in 3D computer graphics.
- Describe advanced computer graphics techniques and applications.
- Analyze computer graphics and solid modelling techniques for various applications.

REFERENCES:

MU5252 DIGITAL IMAGE PROCESSING AND PATTERN RECOGNITION

OBJECTIVES:
- To understand the basic concepts and algorithms of digital processing
- To familiarize the student with the image processing environments like Matlab and its equivalent open source Image processing environments.
- To expose the students to a broad range of image processing techniques and issues and their applications, and to provide the student with practical experiences using them.
- To appreciate the use of image processing in current technologies and to expose the students to real-world applications of the image processing

UNIT I FUNDAMENTALS OF IMAGE PROCESSING
UNIT II IMAGE ENHANCEMENT AND RESTORATION

UNIT III IMAGE SEGMENTATION AND MORPHOLOGY

UNIT IV INTRODUCTION TO PATTERN RECOGNITION

UNIT V IMAGE PATTERN RECOGNITION CASE STUDIES

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course
- The students should be able to implement basic image processing algorithms using MATLAB tools
- Design an application that incorporates different concepts of Image processing
- Apply and explore new techniques in the areas of image enhancement, restoration, segmentation, compression, wavelet processing and image morphology
- Critically analyze different approaches to implements mini projects
- Explore the possibility of Applying image processing concepts in various domains

REFERENCES:
OBJECTIVES:
- To know the fundamental concepts of big data and analytics
- To learn various techniques for mining data streams
- To acquire the knowledge of extracting information from surveillance videos.
- To learn Event Modelling for different applications.
- To understand the models used for recognition of objects in videos.

UNIT I  INTRODUCTION TO BIG DATA & DATA ANALYSIS  9

UNIT II  MINING DATA STREAMS  9

UNIT III  VIDEO ANALYTICS  9

UNIT IV  BEHAVIOURAL ANALYSIS & ACTIVITY RECOGNITION  9
Event Modelling- Behavioural Analysis- Human Activity Recognition-Complex Activity Recognition- Activity modelling using 3D shape, Video summarization, shape based activity models- Suspicious Activity Detection

UNIT V  HUMAN FACE RECOGNITION & GAIT ANALYSIS  9
Introduction: Overview of Recognition algorithms – Human Recognition using Face: Face Recognition from still images, Face Recognition from video, Evaluation of Face Recognition Technologies- Human Recognition using gait: HMM Framework for Gait Recognition, View Invariant Gait Recognition, Role of Shape and Dynamics in Gait Recognition

OUTCOMES:
On successful completion of this course, students will be able to:
- Work with big data platform and its analysis techniques.
- Design efficient algorithms for mining the data from large volumes.
- Work with surveillance videos for analytics.
- Design of optimization algorithms for better analysis and recognition of objects in a scene.
- Model a framework for Human Activity Recognition

REFERENCES:
In this course, students will develop their scientific and technical reading and writing skills that they need to understand and construct research articles. A term paper requires a student to obtain information from a variety of sources (i.e., Journals, dictionaries, reference books) and then place it in logically developed ideas. The work involves the following steps:

1. Selecting a subject, narrowing the subject into a topic
2. Stating an objective.
3. Collecting the relevant bibliography (atleast 15 journal papers)
4. Preparing a working outline.
5. Studying the papers and understanding the authors contributions and critically analysing each paper.
6. Preparing a working outline
7. Linking the papers and preparing a draft of the paper.
8. Preparing conclusions based on the reading of all the papers.
9. Writing the Final Paper and giving final Presentation

Please keep a file where the work carried out by you is maintained.

Activities to be carried Out

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<th>Instructions</th>
<th>Submission week</th>
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<td>2nd week</td>
<td>3% Based on clarity of thought, current relevance and clarity in writing</td>
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<td>Stating an Objective</td>
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| Collecting Information about your area & topic | 1. List 1 Special Interest Groups or professional society  
2. List 2 journals  
3. List 2 conferences, symposia or workshops  
4. List 1 thesis title  
5. List 3 web presences (mailing lists, forums, news sites)  
6. List 3 authors who publish regularly in your area  
7. Attach a call for papers (CFP) from your area. | 3rd week        | 3% (the selected information must be area specific and of international and national standard) |
| Collection of Journal papers in the topic in the context of the objective – collect 20 & then filter | • You have to provide a complete list of references you will be using- Based on your objective -Search various digital libraries and Google Scholar  
• When picking papers to read - try to:  
  • Pick papers that are related to each other in some ways and/or that are in the same field so that you can write a meaningful survey out of them,  
  • Favour papers from well-known journals and conferences, | 4th week        | 6% (the list of standard papers and reason for selection)                      |
- Favour “first” or “foundational” papers in the field (as indicated in other people’s survey paper),
- Favour more recent papers,
- Pick a recent survey of the field so you can quickly gain an overview,
- Find relationships with respect to each other and to your topic area (classification scheme/categorization)
- Mark in the hard copy of papers whether complete work or section/sections of the paper are being considered

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<th>Reading and notes for first 5 papers</th>
<th>Reading Paper Process</th>
<th>5th week</th>
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<td>For each paper form a Table answering the following questions:</td>
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<td>What is the main topic of the article?</td>
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<td>What was/were the main issue(s) the author said they want to discuss?</td>
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<td>Why did the author claim it was important?</td>
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<td>How does the work build on other’s work, in the author’s opinion?</td>
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<td>What simplifying assumptions does the author claim to be making?</td>
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<td>What did the author do?</td>
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<td>How did the author claim they were going to evaluate their work and compare it to others?</td>
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<td>What did the author say were the limitations of their research?</td>
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<td>What did the author say were the important directions for future research?</td>
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<td>Conclude with limitations/issues not addressed by the paper (from the perspective of your survey)</td>
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<th>Reading and notes for next 5 papers</th>
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<th>Reading and notes for final 5 papers</th>
<th>Repeat Reading Paper Process</th>
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<td>Draft outline 1 and Linking papers</td>
<td>Prepare a draft Outline, your survey goals, along with a classification /</td>
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<td>categorization diagram</td>
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<td>Abstract</td>
<td>Prepare a draft abstract and give a presentation</td>
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<td>(Clarity, purpose and conclusion) 6% Presentation &amp; Viva Voce</td>
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<td>Introduction Background</td>
<td>Write an introduction and background sections</td>
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<td>Sections of the paper</td>
<td>Write the sections of your paper based on the classification / categorization diagram in keeping with the goals of your survey</td>
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<td>Your conclusions</td>
<td>Write your conclusions and future work</td>
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<td>(conclusions – clarity and your ideas)</td>
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<td>Final Draft</td>
<td>Complete the final draft of your paper</td>
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<td>(formatting, English, Clarity and linking) 4% Plagiarism Check Report</td>
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<td>Seminar</td>
<td>A brief 15 slides on your paper</td>
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<td>(based on presentation and Viva-Voce)</td>
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TOTAL: 30 PERIODS
OBJECTIVES:
- To explore the various multimedia editing tools like Photoshop/EQV/MATLAB, audacity, Garageband, iMovie and Open CV.
- To explore media processing tools.

The following experiments should be practiced
1. Audio and video editing
2. Image editing
3. 2D and 3D animation

(Tools such as HTML/Frontpage/Dreamweaver, Multimedia application enabling software, System software support for multimedia, Performance measurement tools for multimedia, Multimedia authoring tools, Web tools and applications). The case studies are:
- Video on-demand
- Interactive TV
- Home shopping
- Remote home care
- Electronic album
- Personalized electronic journals

TOTAL: 60 PERIODS

OUTCOMES:
Upon Completion of the course, the students should be able to:
- Process media elements using various multimedia tools
- Create 2D and 3D animations
- Build multimedia applications

OBJECTIVES:
- To understand the basic ideas of compression algorithms related to multimedia components – Text, speech, audio, image and Video.
- To understand the principles and standards and their applications with an emphasis on underlying technologies, algorithms, and performance.
- To appreciate the use of compression in multimedia processing applications
- To understand and implement compression standards in detail.

UNIT I       FUNDAMENTALS OF COMPRESSION
OUTCOMES:
Upon Completion of the course, the students should be able to:
- Implement basic compression algorithms with MATLAB and its equivalent open source environments.
- Design and implement some basic compression standards
- Critically analyze different approaches of compression algorithms in multimedia related mini projects.

REFERENCES:
OBJECTIVES:
- Understand the basics of Computer Graphics.
- Understand the fundamentals of modeling and rendering.
- Understand and work with Gaming software’s.
- Design real time games.

UNIT I MATHEMATICS FOR MODELING

UNIT II CHARACTER MODELING AND SHADING

UNIT III GAME DESIGN PRINCIPLES
Story Telling, Narration, Game Balancing, Core mechanics, Principles of level design, Genres of Games, Collision Detection, Game Logic, Game AI, Path Finding, Renderers, Software Rendering, Hardware Rendering, and Controller based animation, Spatial Sorting, Level of detail, collision detection, standard objects, and physics

UNIT IV GAMING PLATFORMS AND FRAMEWORKS
Flash, DirectX, OpenGL, Java, Python, XNA with Visual Studio, Mobile Gaming for the Android, iOS, Game engines - Adventure Game Studio, DXStudio, Unity

UNIT V GAME DEVELOPMENT
Developing 2D and 3D interactive games using OpenGL, DirectX – Isometric and Tile Based Games, Puzzle games, Single Player games, Multi Player games.

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the student will:
- Analyze the fundamentals of 2D and 3D animation
- Model a character with suitable actions.
- Analyze the game design principle.
- Discuss about gaming platforms and frame works.
- Design a interactive game.
REFERENCES:

MU5002 WEB DESIGN AND PROGRAMMING L T P C 3 0 0 3

OBJECTIVES:
- To understand the issues in the design of web application development
- To learn the concepts of client side and server side technologies
- To learn the concept of three tier application using MVC
- To understand and learn the importance of java based security solutions
- To learn the concepts of software components using EJB
- To learn the concept of other framework

UNIT I WEB DESIGN BASICS

UNIT II CLIENT AND SERVER SIDE SCRIPTING

UNIT III WEB APPLICATION DEVELOPMENT
UNIT IV  COMPONENT BASED DEVELOPMENT  

UNIT V  ADVANCED FRAMEWORKS  

TOTAL : 45 PERIODS

OUTCOMES:
The student should be able to work with
• Design and development of web applications using various models
• Web application development using HTML and scripting technologies
• Web application development using advanced features
• Security features supported in java
• Developing web services using J2EE and related technologies
• Design and development of applications using other frameworks

REFERENCES:

CP5092  CLOUD COMPUTING TECHNOLOGIES  L T P C

OBJECTIVES:
• To understand the concepts of virtualization and virtual machines
• To gain expertise in server, network and storage virtualization.
• To understand and deploy practical virtualization solutions and enterprise solutions
• To gain knowledge on the concept of virtualization that is fundamental to cloud computing
• To understand the various issues in cloud computing
• To be able to set up a private cloud
• To understand the security issues in the grid and the cloud environment

UNIT I  VIRTUALIZATION  
UNIT II  VIRTUALIZATION INFRASTRUCTURE  9

UNIT III  CLOUD PLATFORM ARCHITECTURE  9

UNIT IV  PROGRAMMING MODEL  9
Introduction to Hadoop Framework - Mapreduce, Input splitting, map and reduce functions, specifying input and output parameters, configuring and running a job –Developing Map Reduce Applications - Design of Hadoop file system –Setting up Hadoop Cluster - Cloud Software Environments -Eucalyptus, Open Nebula, Open Stack, Nimbus

UNIT V  CLOUD SECURITY  9
Cloud Infrastructure security: network, host and application level – aspects of data security, provider data and its security, Identity and access management architecture, IAM practices in the cloud, SaaS, PaaS, IaaS availability in the cloud - Key privacy issues in the cloud –Cloud Security and Trust Management

TOTAL : 45 PERIODS

OUTCOMES:
Upon completion of this course, the students should be able to:

- Employ the concepts of storage virtualization, network virtualization and its management
- Apply the concept of virtualization in the cloud computing
- Identify the architecture, infrastructure and delivery models of cloud computing
- Develop services using Cloud computing
- Apply the security models in the cloud environment

REFERENCES:
OBJECTIVES:

- To understand the standard algorithms used to provide confidentiality, integrity and authenticity.
- To understand security issues those arise in communication systems and web services.

UNIT I  BASICS OF CRYPTOGRAPHY  8

UNIT II  DIGITAL WATERMARKING  12

UNIT III  DIGITAL WATERMARKING TECHNIQUES  8

UNIT IV  INTRODUCTION TO DIGITAL STEGANOGRAPHY  7
Types of Steganography - Applications of Steganography - Embedding Security and Imperceptibility - Examples of Steganographic Software

UNIT V  STEGANOANLYSIS  10

TOTAL : 45 PERIODS

OUTCOMES:

- The students would have understood the basic security algorithms required by any computing system.
- The students may be now aware of the security challenges and issues that may arise in any system.
- The students will now be able to design any secure system.

REFERENCES:

OBJECTIVES:
• To understand the basic ideas and principles in biometrics
• To understand the basic concepts of statistical data analysis for validating the biometrics projects
• To familiarize the student with the image processing facilities in Matlab and its equivalent open source tools like OpenCV
• To appreciate the use of biometrics Industrial applications and to understand the role of biometrics in modern security environment
• To understand and implement more advanced topics in current research literature
• To understand the role of multi-biometrics

UNIT I  BIOMETRICS FUNDAMENTALS 9

UNIT II  FINGER AND FACIAL SCAN 9
Finger scan – Features – Components – Operation (Steps) – Competing finger Scan technologies – Strength and weakness. Types of algorithms used for interpretation. Facial Scan - Features – Components – Operation (Steps) – Competing facial Scan technologies – Strength-weakness.

UNIT III  IRIS AND VOICE 9
Iris Scan - Features – Components – Operation (Steps) – Competing iris Scan technologies – Strength and weakness. Voice Scan - Features – Components – Operation (Steps) – Competing voice Scan (facial) technologies – Strength and weakness.

UNIT IV  PHYSIOLOGICAL BIOMETRICS 9

UNIT V  BIOMETRICS APPLICATION DEVELOPMENT 9

TOTAL: 45 PERIODS

OUTCOMES:
Upon Completion of the course, the students should be able to
• Implement basic biometrics related algorithms
• Familiar with the use of MATLAB and its equivalent open source environments
• Design and implement industrial applications that incorporates different concepts of biometrics
• Critically analyze different approaches to implement mini projects in industrial environment and in security related projects
REFERENCES:

MU5071 DATA WAREHOUSING AND DATA MINING L T P C
3 0 0 3

OBJECTIVES:
- Understanding data warehousing and OLAP Concepts
- Understanding of the value of data mining in solving real-world problems.
- Understanding of foundational concepts underlying data mining.
- Understanding of algorithms commonly used in data mining tools

UNIT I DATA WAREHOUSING

UNIT II INTRODUCTION TO DATA MINING
Need for Data Mining, Kinds of Data, Kinds of patterns, Kinds of Applications, Issues, Data Objects and Attribute types, Statistical Descriptions of Data, Data Visualization, Measuring data similarity and dissimilarity, Data Preprocessing

UNIT III ASSOCIATION MINING
Concepts, Frequent Item set Mining Methods, Pattern Evaluation Methods, Pattern Mining in Multilevel, Multidimensional Space, Constraint-Based Frequent Pattern Mining, Mining High-Dimensional Data, Mining Compressed Patterns, Pattern Exploration and Application

UNIT IV CLASSIFICATION
Concepts, Decision Tree Induction, Bayes Classification Methods, Rule-Based Classification, Model Evaluation and Selection, Bagging and Boosting, Random Forests, Bayesian Belief Networks, Backpropagation, SVM, Associative Classification, Lazy learners, Genetic algorithms, Rough Set Approach, Fuzzy Set Approaches, Multi class classification, Semi-supervised classification, Active Learning, Transfer Learning

UNIT V CLUSTERING
Cluster Analysis, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Evaluation, Advanced Cluster Analysis, Outlier Detection, Applications and Trends in Data Mining

TOTAL : 45 PERIODS
OUTCOMES:
Upon Completion of the course, the students will be able to:

- Demonstrate multidimensional modelling of data in a data warehouse
- Display a comprehensive understanding of different data mining tasks and the algorithms most appropriate for addressing them.
- Evaluate models/algorithms with respect to their accuracy.
- Demonstrate capacity to perform a self-directed piece of practical work that requires the application of data mining techniques.
- Conceptualise a data mining solution to a practical problem.

REFERENCES:

MU5005 MULTIMEDIA INFORMATION STORAGE AND RETRIEVAL

OBJECTIVES:

- To introduce the basics of multimedia information storage technology, techniques for analysis, representation and retrieval that is commonly used in industry.
- To compare and contrast information retrieval models and internal mechanisms such as Boolean, Probability, and Vector Space Models.
- To outline the structure of queries and media elements.
- To critically evaluate Multimedia retrieval system effectiveness and improvement techniques.

UNIT I FUNDAMENTAL MEDIA UNDERSTANDING

UNIT II TEXT RETRIEVAL AND MUSIC

UNIT III IMAGE RETRIEVAL
content-based image retrieval; techniques; feature extraction; integration; similarity; feature in INDEXING; interactive retrieval; MPEG-7 standard
UNIT IV VIDEO RETRIEVAL
Content Based Video Retrieval - Video Parsing – Video abstraction and Summarization– Video Content Representation, Indexing and retrieval –Video Browsing Schemes–Example of Video Retrieval Systems

UNIT V RETRIEVAL METRICS AND MODERN IR

OUTCOMES:
Upon the completion of the course the student can able to
• Learn the basics of multimedia information storage technology, techniques for analysis, representation and retrieval that is commonly used in industry.
• Compare and contrast information retrieval models and internal mechanisms such as Boolean, Probability, and Vector Space Models.
• Outline the structure of queries and media elements.
• Critically evaluate Multimedia retrieval system effectiveness and improvement techniques.

REFERENCES:

CP5095 COMPUTER VISION L T P C
OBJECTIVES:
• To review image processing techniques for computer vision
• To understand shape and region analysis
• To understand Hough Transform and its applications to detect lines, circles, ellipses
• To understand three-dimensional image analysis techniques
• To understand motion analysis
• To study some applications of computer vision algorithms

UNIT I IMAGE PROCESSING FOUNDATIONS
Review of image processing techniques – classical filtering operations – thresholding techniques – edge detection techniques – corner and interest point detection – mathematical morphology – texture

UNIT II SHAPES AND REGIONS
UNIT III  
HOUGH TRANSFORM  

UNIT IV  
3D VISION AND MOTION  

UNIT V  
APPLICATIONS  

TOTAL : 45 PERIODS

OUTCOMES:
Upon completion of the course, the students will be able to

- Implement fundamental image processing techniques required for computer vision
- Perform shape analysis
- Implement boundary tracking techniques
- Apply chain codes and other region descriptors
- Apply Hough Transform for line, circle, and ellipse detections
- Apply 3D vision techniques
- Implement motion related techniques
- Develop applications using computer vision techniques

REFERENCES:
OBJECTIVES:
- To know how to analyze and consider user’s need in the interaction system.
- To understand various interaction design techniques and models.
- To understand the theory and framework of HCI.
- Understand and analyze the cognitive aspects of human – machine interaction.

UNIT I INTRODUCTION

UNIT II DESIGN PROCESS

UNIT III IMPLEMENTATION AND EVALUATION PROCESS

UNIT IV MODELS

UNIT V APPLICATIONS

OUTCOMES:
Upon Completion of the course, the students will be able to
- Develop good design for human machine interaction system
- Analyze the user’s need in interaction system
- Design new interaction model to satisfy all types of customers
- Evaluate the usability and effectiveness of various products
- Know how to apply interaction techniques for systems

REFERENCES:
OBJECTIVES:

• To provide information about various medical imaging modalities
• To understand the basic concepts of image enhancement, image restoration, morphological image processing, image segmentation, feature recognition in medical images
• To provide information about classification and image visualization in medical image processing projects
• To familiarize the student with the image processing facilities in Matlab and its equivalent open source tools

UNIT I FUNDAMENTALS OF IMAGE PROCESSING
Image perception, MTF of the visual system, Image fidelity criteria, Image model, Image sampling and quantization – two dimensional sampling theory, Image quantization, Optimum mean square quantizer, Image transforms – 2D-DFT and other transforms.

UNIT II BIO-MEDICAL IMAGE PREPROCESSING

UNIT III MEDICAL IMAGE RECONSTRUCTION
Mathematical preliminaries and basic reconstruction methods, Image reconstruction in CT scanners, MRI, fMRI, Ultra sound imaging, 3D Ultra sound imaging Nuclear, Medical Imaging modalities – SPECT,PET, Molecular Imaging.

UNIT IV IMAGE ANALYSIS AND CLASSIFICATION
Image segmentation- pixel based, edge based, region based segmentation. Active contour models and Level sets for medical image segmentation, Image representation and analysis, Feature extraction and representation, Statistical, Shape, Texture, feature and statistical image classification.

UNIT V IMAGE REGISTRATIONS AND VISUALIZATION
Rigid body visualization, Principal axis registration, Interactive principal axis registration, Feature based registration, Elastic deformation based registration, Image visualization – 2D display methods, 3D display methods, virtual reality based interactive visualization.

OUTCOMES:
Upon Completion of the course, the students should be able to
• Implement basic medical image processing algorithms
• Familiar with the use of MATLAB and its equivalent open source tools
• Design and implement image processing applications that incorporates different concepts of medical Image Processing
• Critically analyze different approaches to implement mini projects in medical domain
• Explore the possibility of applying Image processing concepts in modern hospitals

TOTAL: 45 PERIODS
REFERENCES:

IF5071 GPU ARCHITECTURE AND PROGRAMMING L T P C
3 0 0 3

OBJECTIVES:
- To understand the architecture of GPUs in order to program them effectively.
- To program using GPU programming frameworks.
- To optimize multimedia applications to run on GPUs.

UNIT I GPU ARCHITECTURES 9

UNIT II GPU COMPUTING AND CUDA 9
Introduction – Parallel Programming Languages and models – Evolution of Graphic pipelines – GPGPUs - CUDA Program Structure – Device memories – Data Transfer – Kernel Functions

UNIT III CUDA DETAILS 9
CUDA Threads – Thread Organization – Synchronization & Scalability – CUDA memories – Performance – Imaging Case study

UNIT IV OPENCL BASICS 9

UNIT V OPENCL CONCURRENCY & EXECUTION MODEL 9
OpenCL Synchronization – Kernels – Fences – Barriers – Queueing – Global Synchronization – Memory Consistency – Events – Host side memory model – Device Side memory Model – Case study

TOTAL: 45 PERIODS
OUTCOMES:
At the end of the course, the student will be able to

- Design multimedia applications using GPUs.
- Write Programs for GPUs using CUDA / OpenCL.
- Optimize programs to run on massively parallel architectures.

REFERENCES:

MU5007 SOUND ENGINEERING L T P C
3 0 0 3

OBJECTIVES:
Implement the Standards in the real world service creations.
To know about new generation set-top boxes, hand-held devices, and PC add-in cards.
Understand MPEG-2 System Standards.

UNIT I INTRODUCTION TO BROADCASTING 9

UNIT II DATA BROADCASTING 9

UNIT III DESIGN AND INSTALLATION OF VIDEO AND AUDIO SYSTEMS 9

UNIT IV AUDIO VIDEO STREAMING 9

UNIT V ALGORITHMS AND INTERFACES 9

TOTAL: 45 PERIODS
OUTCOMES:
Upon successful completion of this course, students will be able to:
- Work with big data platform and its analysis techniques.
- Design efficient algorithms for mining the data from large volumes.
- Work with surveillance videos for analytics.
- Design optimization algorithms for better analysis and recognition of objects in a scene.
- Model a framework for Human Activity Recognition.

REFERENCES:

MU5008 SOFTWARE DEVELOPMENT FOR SHORT FILM DEVELOPMENT  L T P C
3  0  0  3

OBJECTIVES:
- Students will be guided by the faculty, in a step by step procedure in making a documentary of their topic.
- At the end of the course, students will produce a documentary as part of their assessment.

UNIT I GRAMMAR OF DOCUMENTARIES 9

UNIT II DEVELOPING THE STORY – PREPRODUCTION 9
Understanding story, story basics, finding the story – Developing story ideas, story structure, time on screen, researching for documentaries, kinds of information, finding people as sources, information management, choosing a subject – Visual scope and visual evidence, permissions, funding, pitching your ideas – Proposals, elements of proposals, resources for writing proposals, attracting funding – Ethics in documentary filmmaking.

UNIT III SHOOTING THE STORY – PRODUCTION 9
Treatment, unscripted and scripted documentaries, planning, and collecting the material – adapting the script, ways to tell a story – Interviews, recce, use of talents, re-enactments, reconstruction & docudrama. Choosing the team, bringing together right people, working together, getting the right camera & equipments, camerawork, producing, directing, directing the crew. Shooting, lighting, location sound, problems & issues.
UNIT IV BUILDING THE STORY – POST PRODUCTION

Building the story in the editing table, working with an editor – Crafting the story, Finding your style – The paper edit, reviewing the footage, assembling of rushes, editing the footages, applying effects, transition – Adding sound effects and music, special effects dubbing, rerecording – Narration – Voiceover, using Music, titles and graphics – Colour exposure and colour correction – Credits & acknowledgements.

UNIT V PROJECT – PRACTICE & SCREENING

Project involving the production and direction of an individually or group authored documentary film, accompanied by a research dossier, a proposal and a treatment. The students will also ensure the exhibition of their films for reviews

TOTAL: 45 PERIODS

OUTCOMES:
- At the end of the course, students will be able to gain adequate skills to produce a documentary for broadcast.
- Students will be able to apply principles of factual program production in their future productions

REFERENCES:

MU5009 VIRTUAL REALITY

OBJECTIVES:
- To impart the fundamental aspects, principles of virtual reality technology
- To gain knowledge about applications of virtual reality

UNIT I INTRODUCTION

UNIT II VR ARCHITECTURE

UNIT III VR MODELING

UNIT IV VR PROGRAMMING

UNIT V VR APPLICATIONS

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course the student should be able to
- To Discuss the basic concepts of Virtual reality
- Develop the Virtual Reality applications in different areas
- Design of various modeling concepts.
- To expose the concept of Virtual Reality Programming with toolkits.

REFERENCES:

MU5010 DIGITAL VIDEO PROCESSING
OBJECTIVES:
To provide an introduction to the fundamental principles and techniques in Video processing.
- To provide an overview of video enhancement and restoration algorithms
- To provide details about video Tracking
- To review latest trends and future technologies in video computing.
UNIT I  FUNDAMENTALS OF VIDEO PROCESSING  9

UNIT II  DIGITAL VIDEO ENHANCEMENT AND SEGMENTATION  9

UNIT III  VIDEO ANALYSIS AND TRACKING  9

UNIT IV  MOTION ESTIMATION  9
Two-Dimensional Motion Estimation - Optical Flow. General Methodologies - Motion Representation, Motion Estimation Criteria, Optimization Methods. Pixel-Based Motion Estimation - Block-Matching Algorithm - Exhaustive Block-Matching Algorithm - Phase Correlation Method and Multiresolution Motion Estimation.

UNIT V  VIDEO CLASSIFICATION AND RECOGNITION  9
Video Classification – Classification and Clustering models – Video Annotation – Video Summarization – Action Recognition - Visual Event Detection.

TOTAL: 45 PERIODS

OUTCOMES:
Upon Completion of the course, the students should be able to
• Implement basic algorithms related to digital video.
• Familiarize with the MATLAB and its equivalent open source tools for processing video.
• Design and implement some basic video related applications in domains like biometrics, object traction and in Industrial environment.
• Critically analyze the role of video in modern technologies.

REFERENCES:
OBJECTIVES:

- To understand the standard algorithms used to provide confidentiality, integrity and authenticity.
- To understand security issues those arise in communication systems and web services.
- To bring the knowledge about the data hiding for image and video with countermeasures for attacks.

UNIT I  CLASSICAL TECHNIQUES AND ENCRYPTION STANDARDS  

UNIT II  AUTHENTICATION  
The RSA Cryptosystem and Factoring Integer - Introduction to Public –key Cryptography, Number theory, The RSA Cryptosystem, Other Attacks on RSA, The ELGamal Cryptosystem, Shanks’ Algorithm, Finite Fields, Elliptic Curves over the Reals, Elliptical Curves Modulo a Prime, Signature Scheme – Digital Signature Algorithm.

UNIT III  MULTIMEDIA DATA HIDING INTRODUCTION  
Overview of Multimedia Data Hiding – Data hiding framework-Key elements -Basic embedding mechanisms-Techniques for Embedding multiple bits-Quantitative model for Uneven embedding Capacity-Constant embedding Rate (CER)-Variable embedding Rate(VER).

UNIT IV  DATA HIDING FOR IMAGE AND VIDEO  

UNIT V  AUTHENTICATION AND ATTACKS WITH COUNTERMEASURES  

TOTAL: 45 PERIODS

OUTCOMES:

- The students would have understood the basic security algorithms required by any computing system.
- The students may be now aware of the security challenges and issues that may arise in any system.
- The students may have idea about the data hiding for image and video with supporting algorithms.
- Students may be now aware of developing data hiding algorithms for the specialized applications.
REFERENCES:

MU5012 MULTIMEDIA CODING TECHNIQUES

OBJECTIVES:
- Understand the importance of multimedia in today’s online and offline information sources and repositories.
- Understand how Text, Audio, Image and Video information can be represented digitally in a computer, so that it can be processed, transmitted and stored efficiently.
- Understand the possibility and limitations of multimedia data compression.
- Understand the basic audio coding techniques including predictive coding and more advanced techniques based around LPC and sub-band coding.
- Understand bi-level Image lossless coding techniques and how these can be extended to code grayscale images, and colour images.
- Understand GIF and JPEG lossless coding techniques.
- Understand lossy Image, video Coding techniques.

UNIT I INTRODUCTION
Multimedia Representation - Text, Audio, Image and Video Representation - Input and Output Transducers - Human Vision and Audio Systems and their Limitations - Sampling, Quantization, Coding, Companding.

UNIT II BASIC CODING TECHNIQUES
Introduction to Data Compression - Information Theory - Statistical Coding - Dictionary Based Coding – Audio Coding.

UNIT III LOSSLESS IMAGE CODING
Bi-Level - Reflected Gray Codes - Predictive Coding – GIF-Lossless JPEG

UNIT IV LOSSY IMAGE CODING

UNIT V VIDEO CODING (LOSSY)
Video Coding Concepts - The Hybrid DPCM/DCT algorithm - Motion Compensated Prediction - Motion Estimation - Standards: H.261, MPEG-1,2,4,7.

TOTAL : 45 PERIODS
OUTCOMES:
Upon Completion of the course, the students will be able to
- Articulate the fundamental properties of media elements
- Analyze the various coding techniques and theory behind.
- Verify the contrast between Lossless and lossy image coding techniques
- Familiarize with Video Coding techniques and standards

REFERENCES:

CP5074 SOCIAL NETWORK ANALYSIS

OBJECTIVES:
- To understand the components of the social network
- To model and visualize the social network
- To mine the users in the social network
- To understand the evolution of the social network
- To know the applications in real time systems

UNIT I INTRODUCTION

UNIT II MODELING AND VISUALIZATION

UNIT III MINING COMMUNITIES
Aggregating and reasoning with social network data, Advanced Representations – Extracting evolution of Web Community from a Series of Web Archive - Detecting Communities in Social Networks - Evaluating Communities – Core Methods for Community Detection & Mining - Applications of Community Mining Algorithms - Node Classification in Social Networks.
UNIT IV EVOLUTION

UNIT V APPLICATIONS
A Learning Based Approach for Real Time Emotion Classification of Tweets, A New Linguistic Approach to Assess the Opinion of Users in Social Network Environments, Explaining Scientific and Technical Emergence Forecasting, Social Network Analysis for Biometric Template Protection

TOTAL : 45 PERIODS

OUTCOMES:
Upon Completion of the course, the students will be able to
- Work on the internals components of the social network
- Model and visualize the social network
- Mine the behaviour of the users in the social network
- Predict the possible next outcome of the social network
- Apply social network in real time applications

REFERENCES:

MU5013 NON LINEAR EDITING

OBJECTIVES:
- To introduce the broad perceptive of linear and nonlinear editing concepts.
- To understand the concept of Storytelling styles.
- To be familiar with the audio and video recording.
- To apply different media tools.
- To learn and understand the concepts of AVID XPRESS DV 4.
UNIT I FUNDAMENTALS
Evolution of filmmaking - linear editing - non-linear digital video - Economy of Expression - risks associated with altering reality through editing.

UNIT II STORYTELLING
Storytelling styles in a digital world through jump cuts, L-cuts, match cuts, cutaways, dissolves, split edits - Consumer and pro NLE systems - digitizing images - managing resolutions - mechanics of digital editing - pointer files - media management.

UNIT III USING AUDIO AND VIDEO
Capturing digital and analog video – importing audio – putting video on – exporting digital video to tape – recording to CDs and VCDs.

UNIT IV WORKING WITH FINAL CUT PRO
Working with clips and the Viewer - working with sequences, the Timeline, and the canvas - Basic Editing - Adding and Editing Testing Effects - Advanced Editing and Training Techniques - Working with Audio - Using Media Tools - Viewing and Setting Preferences.

UNIT V WORKING WITH AVID XPRESS DV 4
Starting Projects and Working with Project Window - Using Basic Tools and Logging - Preparing to Record and Recording - Importing Files - Organizing with Bins - Viewing and Making Footage - Using Timeline and Working in Trim Mode - Working with Audio - Output Options.

TOTAL: 45 PERIODS

OUTCOMES:
- Compare the strengths and limitations of Nonlinear editing.
- Identify the infrastructure and significance of storytelling.
- Apply suitable methods for recording to CDs and VCDs.
- Address the core issues of advanced editing and training techniques.
- Design and develop projects using AVID XPRESS DV 4

REFERENCES:

MU5014 USER INTERFACE DESIGN
OBJECTIVES:
- To understand the basics of User Interface Design.
- To design the user interface, design, menu creation and windows creation
- To understand the concept of menus, windows, interfaces, business functions, various problems in
- windows design with colour, text, Non-anthropomorphic Design.
- To study the design process and evaluations.
UNIT I INTERACTIVE SOFTWARE AND INTERACTION DEVICE

UNIT II HUMAN COMPUTER INTERACTION

UNIT III WINDOWS

UNIT IV MULTIMEDIA

UNIT V DESIGN PROCESS AND EVALUATION

TOTAL: 45 PERIODS

OUTCOMES:
- Knowledge on development methodologies, evaluation techniques and user interface building tools
- Explore a representative range of design guidelines
- Gain experience in applying design guidelines to user interface design tasks.
- Ability to design their own Human Computer

REFERENCES:
4. Deborah Mayhew, The Usability Engineering Lifecycle, Morgan Kaufmann, 1999
OBJECTIVES:
- To understand the fundamentals of Internet of Things
- To learn about the basics of IOT protocols
- To build a small low cost embedded system using Raspberry Pi.
- To apply the concept of Internet of Things in the real world scenario.

UNIT I  INTRODUCTION TO IOT  9
Internet of Things - Physical Design- Logical Design- IoT Enabling Technologies - IoT Levels &
Deployment Templates - Domain Specific IoTs - IoT and M2M - IoT System Management with
NETCONF-YANG- IoT Platforms Design Methodology.

UNIT II  IoT ARCHITECTURE  9
M2M high-level ETSI architecture - IETF architecture for IoT - OGC architecture - IoT reference model
- Domain model - information model - functional model - communication model - IoT reference
architecture.

UNIT III  IoT PROTOCOLS  9

UNIT IV  BUILDING IOT WITH RASPBERRY PI & ARDUINO  9
Building IOT with RASPBERRY PI- IoT Systems - Logical Design using Python – IoT Physical Devices
& Endpoints - IoT Device -Building blocks -Raspberry Pi -Board - Linux on Raspberry Pi - Raspberry
Pi Interfaces -Programming Raspberry Pi with Python - Other IoT Platforms - Arduino.

UNIT V  CASE STUDIES AND REAL-WORLD APPLICATIONS  9
Real world design constraints - Applications - Asset management, Industrial automation, smart grid,
Commercial building automation, Smart cities - participatory sensing - Data Analytics for IoT –
Software & Management Tools for IoT Cloud Storage Models & Communication APIs - Cloud for IoT -
Amazon Web Services for IoT.

TOTAL :45 PERIODS

OUTCOMES:
Upon completion of the course, the student should be able to:
- Analyze various protocols for IoT
- Develop web services to access/control IoT devices.
- Design a portable IoT using Raspberry Pi
- Deploy an IoT application and connect to the cloud.
- Analyze applications of IoT in real time scenario
REFERENCES: