PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

I. To prepare students to excel in research or to succeed in Information Technology Profession by adapting to the rapid advances in new emerging technologies through rigorous post graduate education.

II. To provide students with a solid foundation in mathematical, scientific and engineering fundamentals required to solve real world problems of Industries, Businesses and society.

III. To train students with good scientific and engineering knowledge so as to comprehend, analyze, design, and create novel products and novel IT services.

IV. To inculcate students in solving real time problems through IT knowledge and with attention to team work, effective communication skills, and critical thinking.

V. To provide student with an academic environment aware of excellence, leadership, written ethical codes and guidelines, learning and teamwork for a successful professional career.

PROGRAMME OUTCOMES (POs):
On successful completion of the programme,

1. Graduates will demonstrate creative thinking and abilities needed for multimedia education.
2. Graduates will knowledge of mathematics, science and engineering.
3. Graduates will demonstrate an ability to identify, formulate and exhibit problem solving skills.
4. Graduates will demonstrate creative abilities to make applications exhibit more user friendliness by incorporating multimedia capabilities.
5. Graduate will demonstrate an ability to do research by designing and conducting experiments, analyze and interpret multimedia data individually as well as part of multidisciplinary teams.
6. Graduates will demonstrate an ability to design a system, component or process as per needs and specifications of the customers and society needs.
7. Graduates will demonstrate an ability to prepare short films and documentaries to showcase their knowledge of multimedia tools.
8. Graduate will demonstrate skills to use multimedia tools and to create creative web sites for IT services.
9. Graduates will demonstrate knowledge of professional, ethical, legal, security and social issues and responsibilities.
10. Graduate will be able to communicate effectively in both verbal and written form.
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**EMPLOYABILITY ENHANCEMENT COURSES (EEC)**

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OBJECTIVES:

- To introduce the basic concepts of one dimensional and two dimensional Random Variables.
- To provide information about Estimation theory, Correlation, Regression and Testing of hypothesis.
- To enable the students to use the concepts of multivariate normal distribution and principle components analysis.

Outcomes:

- The course aims at providing the basic concepts of Probability and Statistical techniques for solving mathematical problems which will be useful in solving Engineering problems.

UNIT I

ONE DIMENSIONAL RANDOM VARIABLES 9+3

Random variables - Probability function – Moments – Moment generating functions and their properties – Binomial, Poisson, Geometric, Uniform, Exponential, Gamma and Normal distributions – Functions of a Random Variable.

UNIT II

TWO DIMENSIONAL RANDOM VARIABLES 9+3

Joint distributions – Marginal and Conditional distributions – Functions of two dimensional random variables – Regression Curve – Correlation.

UNIT III

ESTIMATION THEORY: 9+3


UNIT IV

TESTING OF HYPOTHESES: 9+3

Sampling distributions - Type I and Type II errors - Tests based on Normal, t,2 and F distributions for testing of mean, variance and proportions – Tests for Independence of attributes and Goodness of fit.

UNIT V

MULTIVARIATE ANALYSIS: 9+3

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: 45+15:60 PERIODS

OUTCOMES:

- The course provides the basic concepts of Probability and Statistical techniques for solving mathematical problems which is useful in solving Engineering problems.

REFERENCES:

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

UNIT II HIERARCHICAL DATA STRUCTURES

UNIT III GRAPHS

UNIT IV ALGORITHM DESIGN TECHNIQUES

UNIT V NP COMPLETE AND NP HARD

TOTAL: 45 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:
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 9

UNIT II  TRANSFORMATIONS 9
Affine Transformations (2D & 3D): Translation, Rotation, Scaling, Reflection and Shearing; Hierarchical Modeling & viewing: The Camera Transformation – Perspective, orthographic and Stereographic views;

UNIT III  FRACTALS 9
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 12
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 9

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.

TEXT BOOKS:
OBJECTIVES:
- To learn the modeling and 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 basics and usage of Multimedia Databases.
- To learn emerging databases such as Mobile, Cloud and Big Data.
- To acquire inquisitive attitude towards research topics in databases.

UNIT I PARALLEL AND DISTRIBUTED DATABASES 9

UNIT II OBJECT AND OBJECT RELATIONAL DATABASES 9

UNIT III MULTI-DIMENSIONAL DATASTRUCTURES AND MULTIMEDIA DATABASES 9

UNIT IV INTELLIGENT DATABASES 9

UNIT V EMERGING TECHNOLOGIES 9
Mobile Databases - Data Warehousing - Data Mining - Association Rules - Clustering - Classification- Sequential Pattern Mining - Web Databases - Cloud Based Databases - Introduction to Big Data-Storage-Analysis.

TOTAL: 45 PERIODS

OUTCOMES:
Upon Completion of the course, the students will be able,
- To develop in-depth understanding of relational databases and skills to optimize database performance in practice.
- To understand and critique on each type of databases.
- To design faster algorithms in solving practical database problems.
- To implement intelligent databases and various data models.

REFERENCES:
MM7102  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  9

UNIT II  BEST EFFORT AND GUARANTEED SERVICE MODEL  9

UNIT III  MULTIMEDIA ON IP NETWORKS  9
QoS aware routing-RSVP-Integrated and Differentiated services-MPLS-Multicasting-IGMP-PIM-DVMRP

UNIT IV  TRANSPORT LAYER SUPPORT FOR MULTIMEDIA  9
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  9
IEEE 802.11e, IEEE 802.16, 3G networks-UMTS, 3GPP, 4G networks-LTE-IMS.

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:
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  9

UNIT II  IMAGE ENHANCEMENT AND RESTORATION  9

UNIT III  IMAGE SEGMENTATION AND MORPHOLOGY  9

UNIT IV  INTRODUCTION TO PATTERN RECOGNITION  9

UNIT V  IMAGE PATTERN RECOGNITION CASE STUDIES  9

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 Appling image processing concepts in various domains
REFERENCES:

MM7111 COMPUTER GRAPHICS AND ANIMATION LABORATORY  L T P C  0 0 4 2

OBJECTIVES:
- To explore the various multimedia editing tools like Photoshop/ EqV, Audacity, Garageband, iMovie and OpenCV.
- To outline the structure media processing tools.

EXERCISES:
1. Image color/contrast balancing and Enhancement using Photoshop
2. Image compositing using Photoshop
3. Applying special effects using Photoshop
4. Music composing using GarageBand/ Audacity
5. Audio editing using Garageband/Audacity
6. Video Preproduction works
   a. Storyboarding Concepts
   b. Animatics
7. Creation of 2D Animation using Flash/ Director
8. Creation of 3D Animation using 3dsmax/Maya
9. Video Editing using iMovie/ Final cut Pro/ Adobe Premiere
10. Case Study on Open CV
11. Mini Project

TOTAL: 60 PERIODS

OUTCOMES:
Upon the completion the course
- The students should be able to implement small projects using Photoshop and Audacity
- The students should be able to manipulate the images and audio files using Photoshop and Audacity

MM7201 3D GAME MODELING AND RENDERING  L T P C  3 0 0 3

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  9

UNIT II  CHARACTER MODELING AND SHADING  9

UNIT III  GAME DESIGN PRINCIPLES  9
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  9
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  9
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:
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


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:

MM7202 SOFTWARE ENGINEERING AND PROJECT MANAGEMENT

OBJECTIVES:
- To provide information about wider engineering issues that form the background
- To developing complex, evolving (software-intensive) systems
- To plan a software engineering process to account for quality issues and non-functional requirements
- To employ a selection of concepts and techniques to complete a small scale analysis and design in mini projects
- To impart knowledge to translate requirement specifications into a design, and then realize that design practically, all using an appropriate software engineering methodology
- To provide basic knowledge about software project management

UNIT I SOFTWARE PRODUCT AND PROCESS

UNIT II SOFTWARE REQUIREMENTS

UNIT III DESIGN CONCEPTS AND PRINCIPLES

UNIT IV TESTING

UNIT V SOFTWARE PROJECT MANAGEMENT

TOTAL: 45 PERIODS

Attharam
DIRECTOR
Centre For Academic Courses
Anna University, Chennai-600 025.
OUTCOMES:
Upon Completion of the course, the students should be able to
- Implement mini projects incorporating the basic principles of software engineering.
- Describe the basic concepts of software design, implementation.
- Test software of simple mini projects.
- Analyze the Rational Rose and its equivalent open source tools for understanding basic software engineering concepts.
- Design and implement some basic cost estimation models.
- Critically analyze and apply software project management principles in simple projects

REFERENCES:

MM7203 SPEECH AND AUDIO PROCESSING

OBJECTIVES:
- To provide an introduction to the fundamental principles and techniques in Audio processing.
- To provide an overview of Audio enhancement
- To provide details about Audio compression techniques
- To review latest trends and future technologies in speech processing.

UNIT I DIGITAL AUDIO

UNIT II SPEECH PROCESSING

UNIT III MUSICAL SOUND SYNTHESIS AND MIDI
Acoustic Instruments, Sound Synthesis in Music,MIDI Principles - Hardware aspects, Structure of MIDI Messages, General MIDI, MIDI-to-Wav Conversion, Scalable Polyphonic MIDI (SPMIDI), RMID and XMF Files, SAOL and SASLin MPEG 4 Structured Audio, MIDI over USB, MIDI over IEEE 1394.
UNIT IV  STEREO AND SURROUND SOUND
Two-Channel Stereo - Principles of Loudspeaker Stereo and Binaural or Headphone Stereo, Loudspeaker Stereo Over Headphones and Vice Versa, Two-Channel Signal Formats and Microphone techniques, Binaural Recording and ‘Dummy Head’ Techniques, Spot microphones and Two-Channel Panning Laws. Surround Sound - Three Channel Stereo, Four Channel Surround, 5 .1-Channel Surround, and other Multichannel Configurations, Surround Sound Systems, Matrixed Surround Sound Systems Digital Surround Sound Formats, Dolby Digital, DTS, Ambisonics, Surround Sound Monitoring, Surround Sound Recording Techniques, Multichannel Panning Techniques.

UNIT V  MPEG Audio Compression and formats
Basic Audio Compression Techniques- ADPCM in Speech Coding, G.726ADPCM, Vocoder, MPEG Audio Compression - Psychoacoustics, MPEG Audio. Digital Audio Formats and Interchange - Audio File Formats for Digital and Disk formats, Interconnecting Digital Audio Devices

OUTCOMES:
Upon Completion of the course, the students should be able to
• Implement basic algorithms related to Audio Compression.
• Analyze audio compression formats.
• Critically analyze the role of surround sound in modern technologies.

TEXT BOOKS

MM7252  VIDEO PROCESSING AND ANALYTICS
OBJECTIVES:
• To have a better knowledge about videos
• To enrich students with data analytics
• To understand the video content analysis
• To expose the student to various applications and case studies of Video analytics.

UNIT I  VIDEO FUNDAMENTALS
UNIT II  VIDEO SEGMENTATION AND VIDEO FEATURES  9
Fundamentals of Motion Estimation – Optical flow - Pixel Video Features - colour, shape features, Textural features - Feature selection and Dimensionality Reduction.

UNIT III  INTRODUCTION TO ANALYTICS  9
Big-Data - Descriptive data analysis - Analytic Processes and Tools - Regression - Classification - Clustering algorithms - Validation - Multimodal approach to Image and Video data mining - Probabilistic semantic mode - Model based annotation and video mining.

UNIT IV  VIDEO CONTENT ANALYSIS AND ANALYTICS  9
Introduction- Detecting Shot Boundaries in Video – Parsing a Video into Semantic Segments – Video Indexing and Abstraction for Retrievals – Affective Video Content Analysis - Automatic Video Trailer Generation - Video database - Video categorization - Video query categorization

UNIT V  EMERGING TRENDS  9
Object Segmentation and Tracking in the Presence of Complex Background – Video Inpainting – Video Summarization – Forensic video analysis

TOTAL:45 PERIODS

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

- Discuss video processing fundamentals
- Analyze video features
- Formulate various application of video processing

REFERENCES:

MM7211  WEB PROGRAMMING AND DESIGN LABORATORY  L T P C
0 0 4 2

OBJECTIVES:

- To learn how to create a simple web page using html along with the usage of style sheets, lists, creation or tables with borders, padding and colors.
- To get acquainted with JavaScript and how to embed JavaScript in Html code.
- To construct dynamic server-side web pages and integrate the Web application with many of the other Java2 Enterprise Edition application server methodologies
- To develop Java Enterprise Applications using EJB3 and other Java EE technology and J2ME.

EXERCISES:
1. Web programming with HTML tags, CSS for styling, Page layout
2. Develop webpages using JavaScript for client side programming and HTML forms
3. Using The DOM and the JavaScript object models
4. Website optimization: crunching HTML, using CSS to replace HTML and light-weight graphics to speed up websites
5. Creating XML file with XML DTD and XML schema, SAX, XSL
6. Web site creation with PHP for server side programming for storing current date-time using cookies and for storing page views using sessions
7. Web application development using Servlet/ PHP/ JSP/ ASP.NET
8. Working with PHP and MySQL
9. Constructing dynamic server-side web pages using JSF and integrate the Web application with many of the other Java2 Enterprise Edition application server methodologies such as Enterprise Java Beans, JavaMail, and SOAP.
10. Developing Java Enterprise Applications Using EJB3 Session beans, entity beans and message-driven beans.
11. Working with JNDI, JDBC, JMS.
12. Application development using J2ME.

TOTAL: 60 PERIODS

OUTCOMES:
Web application development using HTML and scripting technologies.
• Hands on experience on Web application development using advanced features.
• Design and development of dynamic server-side web pages.
• Develop web services using J2EE and related technologies
• Design and development of applications using other frameworks

MM7351 MULTIMEDIA COMPRESSION TECHNIQUES               L T P C
3 0 0 3

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 9

UNIT II TEXT COMPRESSION 9

UNIT III IMAGE COMPRESSION 9

UNIT IV AUDIO COMPRESSION 9
UNIT V VIDEO COMPRESSION

OUTCOMES:
Upon Completion of the course, the students should be able to
- Implement basic compression algorithms familiar with the use of 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

MM7003 CLOUD COMPUTING
OBJECTIVES:
- To understand the concept of cloud and utility computing
- To understand the various issues in cloud computing
- To familiarise themselves with the lead players in cloud
- To appreciate the emergence of cloud as the next generation computing paradigm
- To be able to set up a private cloud

UNIT I INTRODUCTION

UNIT II VIRTUALIZATION

UNIT III CLOUD INFRASTRUCTURE
UNIT IV  PROGRAMMING MODEL  10
Parallel and Distributed programming Paradigms – MapReduce, Twister and Iterative
MapReduce – Hadoop Library from Apache – Mapping Applications - Programming Support -
Google App Engine, Amazon AWS - Cloud Software Environments -Eucalyptus, Open nebula,
OpenStack.

UNIT V  SECURITY IN THE CLOUD  9

TOTAL = 45 PERIODS

OUTCOMES:
• Articulate the main concepts, key technologies, strengths and limitations of cloud computing
• Identify the architecture, infrastructure and delivery models of cloud computing
• Explain the core issues of cloud computing such as security, privacy and interoperability
• Choose the appropriate technologies, algorithms and approaches for the related issues

TEXT BOOKS:
1. Distributed and Cloud Computing, From Parallel Processing to the Internet of Things by Kai
2. Cloud Computing: Implementation, Management, and Security by John W.Rittinghouse and
James F.Ransome : CRC Press 2010

REFERENCES:
2. Cloud Application Architectures: Building Applications and Infrastructure in the Cloud: Transactional Systems for EC2 and Beyond (Theory in Practice (O'Reilly)) by George Reese: O'Reilly

MM7005  MEDIA SECURITY  L T P C
3 0 0 3

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
Techniques - Encryption Evaluation metrics - Histogram Deviation - orthogonal Frequency
Division Multiplexing - OFDM model - OFDM Limitations.
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  STEGANALYSIS  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

MM7002  BIOMETRICS  L T P C
3 0 0 3

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

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

TEXT BOOKS:

TOTAL: 45 PERIODS
OBJECTIVES:
- To understand Data mining principles and techniques and introduce Data Mining as a cutting edge business intelligence.
- To expose the students to the concepts of Data Warehousing Architecture and Implementation.
- To study the overview of developing areas – Web mining, Text mining and ethical aspects of Data mining.
- To identify Business applications and Trends of Data mining.

UNIT I DATA MINING & DATA WAREHOUSING 8
Introduction to KDD process – Knowledge Discovery from Databases - Data Warehousing -
OLAP queries & Tools.

UNIT II DATA PREPROCESSING & ASSOCIATION RULE MINING 9
Need for Data Preprocessing – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation - Association Rule Mining - Mining Frequent Itemsets with and without Candidate Generation - Mining Various Kinds of Association Rules - Constraint-Based Association Mining.

UNIT III CLASSIFICATION & PREDICTION 10
Classification vs Prediction – Data preparation for Classification and Prediction – Classification by Decision Tree Introduction – Bayesian Classification – Rule Based Classification – Classification by Back propagation – Support Vector Machines – Associative Classification – Other Classification Methods – Prediction – Accuracy and Error Measures – Evaluating the Accuracy of a Classifier or Predictor – Ensemble Methods – Model Section.

UNIT IV CLUSTERING 10

UNIT V APPLICATIONS 8
Multimedia data indexing & Retrieval – Content analysis & classification in image & video -
Clustering applications to images – Mining frequent events from video – Data mining approached to Music.

TOTAL: 45 PERIODS

OUTCOMES:
Upon Completion of the course, the students will be able to,
- Evolve Multidimensional Intelligent model from typical system.
- Discover the knowledge imbibed in the high dimensional system.
- Evaluate various mining techniques on complex data objects.

REFERENCES:
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  9

UNIT II  TEXT RETRIEVAL AND MUSIC  9

UNIT III  IMAGE RETRIEVAL  9
content-based image retrieval; techniques; feature extraction; integration; similarity; feature INDEXING; interactive retrieval; MPEG-7 standard

UNIT IV  VIDEO RETRIEVAL  9
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  9

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:
OBJECTIVES:
- To understand the importance of data visualization.
- To know the different types of visualization techniques.
- To create various visualizations

UNIT I  INTRODUCTION

UNIT II  FOUNDATIONS FOR DATA VISUALIZATION
Visualization stages – Experimental Semiotics based on Perception Gibson’s Affordance theory – A Model of Perceptual Processing – power of visual perception-Types of Data-visualization and data objects.

UNIT III  COMPUTER VISUALIZATION
Non-Computer Visualization – Computer Visualization: Exploring Complex Information Spaces – Fisheye Views – Applications – Comprehensible Fisheye views – Fisheye views for 3D data – Interacting with visualization

UNIT IV  MULTIDIMENSIONAL VISUALIZATION

UNIT V  CASE STUDIES
Small interactive calendars – Selecting one from many – Web browsing through a key hole – Communication analysis – Archival analysis

OUTCOMES:
Upon Completion of the course, the students will be able
- To Compare various visualization techniques.
- Design creative visualizations.
- Apply visualization over different types of data.

TEXT BOOKS:

REFERENCE:
OBJECTIVES:
• To provide knowledge about computer vision algorithms
• To understand the basic concepts of camera calibration, stereoscopic imaging and higher level image processing operations
• To familiarize the student with the image processing facilities in Matlab and its equivalent open source tools like OpenCV
• To appreciate the use of computer vision in Industrial applications and to understand the role of computer vision
• To understand and implement more advanced topics in current research literature

UNIT I  FUNDAMENTALS OF VISION

UNIT II  IMAGE FEATURES

UNIT III  CAMERA CALIBRATION AND STEREO GEOMETRY
Camera Parameters – Intrinsic and Extrinsic parameters – Direct Parameter Calibration – Extraction from Projection matrix, Stereopsis – Correspondence Problem –RANSAC and Alignment - Epipolar Geometry

UNIT IV  MOTION DETECTION AND SHAPE FROM CUES

UNIT V  HIGH LEVEL VISION
Interpretation trees, Invariants – Appearance and Shape based Classification – 3D object modeling – Matching from Intensity Data – Matching from Range Data – Visual Recognition – AdaBoost and Random Decision Forests.

OUTCOMES:
Upon Completion of the course, the students should be able to
• Implement basic computer vision algorithms
• Familiar with the use of MATLAB and OpenCV environment
• Design and implement industrial applications that incorporates different concepts of medical Image Processing
• Critically analyze different approaches to implement mini projects in industrial environment.

REFERENCES:
OBJECTIVES:
- To understand the basics of Ad-hoc & Sensor Networks.
- To learn various fundamental and emerging protocols of all layers.
- To study about the issues pertaining to major obstacles in establishment and efficient management of Ad-hoc and sensor networks.
- To understand the nature and applications of Ad-hoc and sensor networks.
- To understand various security practices and protocols of Ad-hoc and Sensor Networks

UNIT I

UNIT II

UNIT III

UNIT IV

UNIT V

TOTAL : 45 PERIODS

OUTCOMES:
Upon Completion of the course, the students should be able to
- To conversant with Ad-hoc and sensor networks, protocols and standards.
- To establish a Sensor network environment for different type of applications

REFERENCES:
OBJECTIVES:

- To understand the basics of Mobile Computing and Personal Computing.
- To learn the role of wireless networks in Mobile Computing and Pervasive Computing.
- To study about the underlying wireless networks.
- To understand the architectures of mobile and pervasive applications.
- To become familiar with the pervasive devices and mobile computing platforms.

UNIT I  INTRODUCTION


UNIT II  3G AND 4G CELLULAR NETWORKS


UNIT III  SENSOR AND MESH NETWORKS


UNIT IV  CONTEXT AWARE COMPUTING


UNIT V  APPLICATION DEVELOPMENT


TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course the student should be able

- To deploy 3G networks.
- To develop suitable algorithms for 4G networks.
- To use sensor and mesh networks to develop mobile computing environment.
- To develop mobile computing applications based on the paradigm of context aware computing.
REFERENCES:

IF7074 HUMAN COMPUTER INTERACTION L T P C
3 0 0 3

OBJECTIVES:
- To learn the principles and fundamentals of human computer interaction (HCI)
- To analyze HCI theories, as they relate to collaborative or social software.
- To Establish target users, functional requirements, and interface requirements for a given computer application.
- To understand user interface design principles, and apply them to designing an interface.
- To learn user interface designs through usability inspection and user models
- To know the applications of multimedia on HCI.

UNIT I DESIGN PROCESS

UNIT II DESIGN AND EVALUATION OF INTERACTIVE SYSTEMS

UNIT III MODELS

UNIT IV EXPERIMENTAL DESIGN AND STATISTICAL ANALYSIS OF HCI
UNIT V  THEORIES

OUTCOMES:
Upon Completion of the course, the students will be able to
- Interpret the contributions of human factors and technical constraints on human– computer interaction.
- Evaluate the role of current HCI theories in the design of software.
- Apply HCI techniques and methods to the design of software.
- Categorize and carefully differentiate various aspects of multimedia interfaces.
- Design and develop issues related to HCI for real application.

TEXT BOOKS:

REFERENCES:

MM7251  MEDICAL IMAGE PROCESSING  L T P C  3 0 0 3

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  9
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  9

UNIT III  MEDICAL IMAGE RECONSTRUCTION  9
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
9
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
9
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.

TOTAL : 45 PERIODS

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

REFERENCES:

IF7073 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
CUDA Threads – Thread Organization – Synchronization & Scalability – CUDA memories –
Performance – Imaging Case study

UNIT IV  OPENCL BASICS
OpenCL Standard – Kernels – Host Device Interaction – Execution Environment – Memory
Model – Basic OpenCL Examples.

UNIT V  OPENCL CONCURRENCY & EXECUTION MODEL
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:
4. J. Sanders and E. Kandrot, “CUDA by Example: An Introduction to General-Purpose GPU

MM7001  BIG DATA ANALYTICS  L T P C
3 0 0 3

OBJECTIVES:
- To understand the applications using Map Reduce Concepts.
- To learn to use various techniques for mining data stream.
- To understand the various search methods and visualization techniques.
- To learn to analyze the big data using intelligent techniques.

UNIT I  INTRODUCTION TO BIG DATA
Introduction to BigData Platform – Challenges of Conventional Systems - Intelligent data analysis –
Nature of Data - Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic
Tools - Statistical Concepts: Sampling Distributions - Re-Sampling - Statistical Inference -
Prediction Error.

UNIT II  MINING DATA STREAMS
Introduction To Streams Concepts – Stream Data Model and Architecture - Stream Computing -
Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream –
Estimating Moments – Counting Oneness in a Window – Decaying Window - Real time Analytics
Platform(RTAP) Applications - Case Studies - Real Time Sentiment Analysis, Stock Market
Predictions.
UNIT III  HADOOP
History of Hadoop - The Hadoop Distributed File System – Components of Hadoop- Analyzing the Data with Hadoop- Scaling Out- Hadoop Streaming- Design of HDFS-Java interfaces to HDFS-Basics-Developing a Map Reduce Application-How Map Reduce Works-Anatomy of a Map Reduce Job run-Failures-Job Scheduling-Shuffle and Sort – Task execution - Map Reduce Types and Formats- Map Reduce Features

UNIT IV  HADOOP ENVIRONMENT

UNIT V  FRAMEWORKS
Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services – HiveQL – Querying Data in Hive - fundamentals of HBase and ZooKeeper - IBM InfoSphere BigInsights and Streams. Visualizations - Visual data analysis techniques, interaction techniques; Systems and applications

OUTCOMES:
Work with big data platform
• The students will be able to Analyze the HADOOP and Map Reduce technologies associated with big data analytics
• Design efficient algorithms for mining the data from large volumes.
• Analyze the big data analytic techniques for useful business applications.
• Explore on Big Data applications Using Pig and Hive
• Discuss the fundamentals of various big data analysis techniques

REFERENCES:
11. Michael Minelli (Author), Michele Chambers (Author), Ambiga Dhiraj (Author) , Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses,Wiley Publications,2013

TOTAL : 45 PERIODS

36
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
Frequency bands – Propagation and Modulation- Radio and Television Transmission System-
Transmitting Antennas and Systems - RF System Maintenance – Test Equipments – Audio Test
and Measurements – Video Signal Measurement and Analysis.

UNIT II DATA BROADCASTING 9
Introduction to data Broadcasting- Data Broadcasting system overview and Architecture- Mpeg 2
Transport Basics- Data Categorization- Service Description Frame work – Synchronized

UNIT III DESIGN AND INSTALLATION OF VIDEO AND AUDIO SYSTEMS 9
Basics Of Television - Analog Video Fundamentals – Digital Video Fundamentals – Analog Audio
fundamentals - Digital Audio Fundamentals – Data Multiplexing – Transition to DTD.

UNIT IV AUDIO VIDEO STREAMING 9
Introduction to streaming media – Video Encoding – Audio Encoding – Preprocessing –Stream

UNIT V ALGORITHMS AND INTERFACES 9
Color Introduction to Luma and Chroma – Introduction to Component SDTV – Introduction to
HDTV – Digital Video Interfaces – Filtering And Sampling – Image Digitization and
Reconstructions – Perceptions and Visual Activity – DeInterlacing – DV Compressions - Digital
television Standards.

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.

TOTAL : 45 PERIODS

TEXT BOOKS:
1. The technology of video and audio streaming 2nd edition David Austerberry 2005 ELSEVIER
   focal press
3. Digital Video And HDTV Algorithm and Interfaces – Charles Poynton – Morgan Kaufman
   Publishers – 2007

REFERENCES:
1 standard Handbook of Broadcast Engineering – Jerry C. Whitaker – Mcgraw Hill Publications
   2005
2. Digital Television Fundamentals - Design and Installation of Video and Audio Systems - Mcgraw
OBJECTIVES:

- To learn the characteristics of mobile applications.
- To understand the intricacies of UI required by mobile applications.
- To study about the design aspects of mobile application.
- To learn development and programming of mobile applications.

UNIT I INTRODUCTION

Objectives

1. Mobile Applications – Characteristics and Benefits
2. Application Model – Infrastructure and Managing Resources
3. Mobile Software Engineering – Frameworks and Tools

UNIT II USER INTERFACE

Objectives

1. Generic UI Development – VUIs and Mobile Applications
2. Text to Speech techniques – Designing the right UI
3. Multimodal and Multichannel UI – Gesture based UIs
4. Screen Elements and Layouts
5. Voice XML – Java API.

UNIT III APPLICATION DESIGN

Objectives

1. Memory Management – Design patterns for limited memory
2. Work flow for Application Development – Techniques for composing Applications
3. Dynamic Linking – Plug ins and rules of thumb for using DLLs
4. Concurrency and Resource Management
5. Look and feel.

UNIT IV APPLICATION DEVELOPMENT

Objectives

1. Intents and Services – Storing and Retrieving data
2. Communication via the Web – Notification and Alarms
3. Graphics and Multimedia – Telephony
4. Location based services – Packaging and Deployment
5. Security and Hacking.

UNIT V TOOLS

Objectives

1. Google Android Platform – Eclipse Simulator
2. Android Application Architecture – Event based programming
3. Apple iPhone Platform – UI tool kit interfaces
4. Event handling and Graphics services – Layer Animation.

OUTCOMES:

Upon Completion of the course, the students should be able to:

- To design and implement the user interfaces of mobile applications.
- To design the mobile applications that is aware of the resource constraints of the mobile devices.
- To develop advanced mobile applications that accesses the databases and the web.
- To develop useful mobile applications in the current scenario using Google Android and Eclipse simulator.

REFERENCES:

OBJECTIVES:
- Students will gain solid knowledge base to design, build, manage and deploy dynamic content for the web.
- This course focuses on the overall production process with particular emphasis on design elements involving layout, navigation and interactivity.
- The students will create effective web pages combining text, images and animation.

UNIT I  INTERNET TECHNOLOGY  9

UNIT II  STYLE AND FORMAT  9

UNIT III  WYSIWYG WEB DESIGN  9

UNIT IV  DATABASE CONCEPTS  9
Introduction to database: Database management, Database Systems concept and history, Logical and physical organization of data, database models, and data independence – Relational databases concepts – Embedding database languages in general programming languages – Introduction to Structured Query Language and its elements.

UNIT V  INTERACTIVE INTERNET TOOLS  9

TOTAL: 45 PERIODS

OUTCOMES:
- To make the students appreciate the importance of knowing web designing and development.
- To acquaint the students with the basics of designing and developing a dynamic website.
- To enable the students to create a website and use different interactive internet tools.

TEXT BOOKS:
2. R. Lavanya. HTML 5, Ane Books Publisher, New Delhi, 2011.

REFERENCES:
1. Jon Duckett. HTML and CSS: Design and Build Websites, John Wiley and Sons Publisher, 2011.
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

UNIT II DEVELOPING THE STORY – PREPRODUCTION
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
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.

TEXTBOOKS:
MM7009 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:

MM7071 DIGITAL VIDEO PROCESSING L T P C
3 0 0 3

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: