1. PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):
   - To succeed in E-Learning Technologies Profession by adapting to the rapid advances in new emerging technologies
   - To foster the art and science of instructional design and develop practical skills to analyze performance, create new solutions, that meet instructional design models.
   - To inculcate leadership qualities, ethical attitude, team work and effective communication skills for successful professional growth.

2. PROGRAMME OUTCOMES (POs):
   After going through the two years of study, our students will exhibit the following:

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<th>PO #</th>
<th>PROGRAMME OUTCOME</th>
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<tbody>
<tr>
<td>1</td>
<td>Create, select, learn and apply appropriate techniques, resources, modern engineering, IT and e-learning tools, for e-learning activities with an understanding of the limitations.</td>
</tr>
<tr>
<td>2</td>
<td>Think laterally and originally, conceptualize and solve engineering education problems, evaluate a wide range of potential solutions for those problems and arrive at feasible, optimal solutions after considering, cultural, societal and environmental factors in the core areas of expertise.</td>
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<tr>
<td>3</td>
<td>An ability to independently carry out research/investigation and development work to solve practical problems in the e-Learning design and delivery system and to write and present a substantial technical report/document on the e-learning projects</td>
</tr>
<tr>
<td>4</td>
<td>Acquire professional and intellectual integrity, professional code of conduct, ethics of research and scholarship, consideration of the impact of research outcomes on professional practices and an understanding of responsibilities.</td>
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<tr>
<td>5</td>
<td>Demonstrate knowledge and understanding of engineering education and management principles and apply the same to e-learning framework design, as a member and leader in a team, manage projects efficiently in e-learning models design.</td>
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<tr>
<td>6</td>
<td>Recognize the need for, and have the preparation and ability to engage in life-long learning independently, with a high level of enthusiasm and commitment to improve knowledge and competence continuously.</td>
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3. MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES WITH PROGRAMME OUTCOMES:

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**TOTAL CREDITS (I–IV)**

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<td>Python Programming</td>
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<td>Student Psychology</td>
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<td>LE5004</td>
<td>Training and Development</td>
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<td>Learning Science</td>
<td>PE</td>
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<td>LE5006</td>
<td>Multimedia Databases</td>
<td>PE</td>
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<td>LE5007</td>
<td>Software Project Management and Quality</td>
<td>PE</td>
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<td>Knowledge Engineering and Management</td>
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<td>LE5010</td>
<td>Multimedia Retrieval Techniques</td>
<td>PE</td>
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<td>LE5011</td>
<td>Mobile Application Development Practices</td>
<td>PE</td>
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<td>4</td>
<td>LE5012</td>
<td>Design and development of MOOC</td>
<td>PE</td>
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<td>LE5014</td>
<td>Multi Media Security Techniques</td>
<td>PE</td>
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<td>LE5015</td>
<td>Social Media Web Analytics</td>
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<td>LE5016</td>
<td>Educational Management Information System</td>
<td>PE</td>
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<td>LE5017</td>
<td>Human Computer Interaction Techniques</td>
<td>PE</td>
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<td>2</td>
<td>LE5018</td>
<td>Visualization Techniques</td>
<td>PE</td>
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<td>LE5019</td>
<td>Sound Design Techniques</td>
<td>PE</td>
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<td>4</td>
<td>LE5020</td>
<td>Video Processing and Analytics</td>
<td>PE</td>
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OBJECTIVES

This course is designed to provide the solid foundation on topics in 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, design of experiments and time series analysis.

UNIT I PROBABILITY AND RANDOM VARIABLES 12

UNIT II ESTIMATION THEORY 12

UNIT III TESTING OF HYPOTHESIS 12
Sampling distributions – Small and large samples and problems – Tests based on Normal, t-distribution, Chi-square, Goodness of fit and F-distributions.

UNIT IV DESIGN OF EXPERIMENTS 12
Analysis of variance – Completely randomized design – Randomized block design – Latin square design – $2^2$ Factorial designs.

UNIT V TIME SERIES 12
Characteristics and representation – Moving averages – Exponential smoothing – Auto regressive processes.

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.
● Least squares, correlation, regression, consistency, efficiency and unbiasedness of estimators, method of maximum likelihood estimation and Central Limit Theorem.
● Use statistical tests in testing hypotheses on data.
● List the guidelines for designing experiments and recognize the key historical figures in Design of Experiments.
● Differentiate between various time series models and application of these models appropriately to engineering problems.
● 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

LE5101 PRINCIPLES OF MULTIMEDIA

OBJECTIVES
- To understand different forms of media in systems.
- To acquire knowledge in multimedia components.
- To acquire knowledge about multimedia tools and authoring.
- To acquire knowledge in the development of multimedia applications.
- To explore the latest trends and technologies in multimedia

UNIT I INTRODUCTION

Suggested Activities:
- Flipped classroom on media Components.
- External learning – Interactive presentation.

Suggested Evaluation Methods:
- Tutorial – Handling media components
- Quizzes on different types of data presentation.

UNIT II ELEMENTS OF MULTIMEDIA

Suggested Activities:
- Flipped classroom on different file formats of various media elements.
- External learning – Adobe after effects, Adobe Media Encoder, Adobe Audition.

Suggested Evaluation Methods:
- Demonstration on after affects animations.
- Quizzes on file formats and color models.

UNIT III MULTIMEDIA SYSTEMS

Suggested Activities:
- Flipped classroom on concepts of multimedia hardware architectures.
- External learning – Digital repositories and hypermedia design.

Suggested Evaluation Methods:
- Quizzes on multimedia hardware and compression techniques.
- Tutorial – Hypermedia design.

UNIT IV MULTIMEDIA TOOLS


Suggested Activities:
- Flipped classroom on multimedia tools.
- External learning – Comparison of various authoring tool.

Suggested Evaluation Methods:
- Tutorial – Audio editing tool.
- Quizzes on animation tool.

UNIT V MULTIMEDIA APPLICATION DEVELOPMENT


Suggested Activities:
- External learning – Game consoles.
- External learning – VRML scripting languages.

Suggested Evaluation Methods:
- Demonstration of simple interactive game.
- Tutorial – Simple VRML program.

PRACTICAL EXERCISES:

1. Install tools like GIMP, Photoshop, Blender.
2. Design a simple web page with animated web advertisement.
3. Creating visual effects by editing and mixing various media elements using tools like Adobe Premier Pro.
4. Use Adobe after effects for creating lighting effects and shades.
5. Use Adobe audition for sound mixing.
6. Use Adobe media encoder for coding an audio.
7. Use Photoshop to create a button, banner and texture.
8. Use Photoshop to create morphing and animation.
9. Develop a full-fledge multimedia application.
10. Develop a digital story boarding and 3D animation as mini project.
OUTCOMES

- Handle the multimedia elements effectively.
- Articulate the concepts and techniques used in multimedia applications.
- Develop effective strategies to deliver Quality of Experience in multimedia applications.
- Design and implement algorithms and techniques applied to multimedia objects.
- Design and develop multimedia applications following software engineering models.

TOTAL : 45+30=75 PERIODS

REFERENCES


LE5102

ANIMATION TECHNIQUES

OBJECTIVES

- To understand the fundamentals of animation.
- To know the working principles of animation tools.
- To acquire knowledge about the issues in 2D and 3D animation.
- To train the student as a member or leader in diverse teams of animation.
- To gain skill in designing real time animation movie.

UNIT I

INTRODUCTION TO ANIMATION


Suggested Activities:

- Flipped classroom on properties of multimedia systems design elements
- External learning – Graphics display devices and input devices

Suggested Evaluation Methods:

- Quizzes based on designing elements
- Assignment on latest input and output devices

UNIT II

PERSPECTIVE IN ANIMATION

Perspective Blocks and Boxes – Vanishing Point in Horizon – Outside Horizon and Indoors – Scale Diagrams in Perspective – Different View Points – Importance of Eye Level – Curves and Cylinders in Perspective – Perspective in 1 point, 2 point, 3 point, Multiple Points – Shapes in Perspective with Light and Shade – Foreshortening.

Suggested Activities:

- Flipped classroom on discussion on projection
- External learning – Camera mechanism

Suggested Evaluation Methods:

- Tutorials – Viewing port and camera positing
- Assignment on camera working and principles

UNIT III

ANIMATION PRINCIPLE

Drawing for Animation – Sequential Movement Drawing – Caricaturing the Action – Thumbnails – Motion Studies – Drawing for Motion – Basic Principles in Animation – Squash and Stretch –

**Suggested Activities:**

- Flipped classroom on drawing gestures, facial expressions and pose to pose sketching. · External learning – Sketching from acting, sketching from live models.

**Suggested Evaluation Methods:**

- Tutorial – Drawing body movements and facial expression. · Assignments on sketching various animal movements.

**UNIT IV ANIMATION PRESENTATION**


**Suggested Activities:**

- Flipped classroom on different special effects · Discussion on slow and fast actions and movements of the objects

**Suggested Evaluation Methods:**

- Tutorial – Environmental and surrounding Effects · Assignments on physical nature of the objects

**UNIT V ADVANCES IN ANIMATION**


**Suggested Activities:**

- Flipped classroom on designing web pages. · External learning – Sound editing tools.

**Suggested Evaluation Methods**

- Tutorial – Creating web pages. · Assignment on different sound effects and background music.

**PRACTICAL EXERCISES:**

1. Simple 2D text animation
2. Implementing morphing, and Tweening
3. Implementation Animation with control buttons
4. Creating interactive slide shows
5. Adding back ground music and voice over to animation sequence
6. Editing the animation sequence and adding transitions
7. Story-board writing
8. Adding visual effects
9. Designing models, objects and background environment
10. Exporting a simple animation output

**TOTAL : 45+30=75 PERIODS**
OUTCOMES

- Demonstrate the concepts and techniques used in Animation.
- Apply the physics and basic movements of character.
- Conduct various experiment for effective modern interactive Animation.
- Design and implement algorithms and techniques applied to Animation.
- Apply various tools and software efficiently to up-hold the professional and social obligation.

REFERENCES


LE5103 INSTRUCTIONAL SYSTEMS DESIGN

OBJECTIVES

- Analyse and discuss various learning theories and how they relate to e-Learning design
- Acquire a working knowledge of instructional systems design
- Explain Bloom’s taxonomy and its implications on learning strategies and objectives
- Apply the instructional systems design model to a learning environment
- Produce analysis and design outputs at each stage of the ISD process
- Develop an evaluation plan for the E-Learning

UNIT I LEARNING THEORIES AND PRINCIPLES


UNIT II INSTRUCTIONAL DESIGN MODELS AND THEORIES

Overview of Instructional Design (ID) – Instructional System Design Models - ADDIE Models – Dick and Carey Model — Rapid eLearning Design - 4C-ID Model
ASSURE Model – Collaborative Learning - Scenario-Based Learning - Problem-Based Learning
- Top Down and Bottom up models in curriculum Development
UNIT III INSTRUCTIONAL DESIGN PROCESSES

Learning Domains – Taxonomy for Cognitive, Psychomotor, Affective - Blooms Revised Taxonomy – Constructing Learning objectives - Gagne’s Nine principles of ID - Learners and Learning Styles - Vygotsky: Language of thought - Banner-Memory and learning -Structuring the online course - Role of Instructional Designer

UNIT IV INSTRUCTIONAL DEVELOPMENT – STRATEGIES AND MATERIALS


UNIT V ASSESSMENT AND EVALUATION


TOTAL: 45 PERIODS

OUTCOMES

1. Demonstrate a working knowledge of instructional systems development (ISD) process and instructional design models through class discussion and collaborative activities
2. Create a design document for a training program in a selected work setting
3. Demonstrate ability to use computer-based technologies effectively to facilitate instructional design process.
4. Formulate instructional objectives and design learning activities and assessments for a specified online course
5. Determine the quality, effectiveness, and continuous improvement of the e-Learning

REFERENCES

OBJECTIVES

- To learn the various E-learning approaches and Components.
- To understand the key elements of Design Thinking.
- To explore the models for E-learning courseware development.
- To design E-learning courses using Authoring tools.
- To analyze various E-learning solutions for design and development

UNIT I  INTRODUCTION  9

Suggested Activities:
- External learning - E-learning approaches and components.
- Discussion on design thinking.

Suggested Evaluation Methods:
- Assignment on E-learning approaches and components.
- Quiz on design thinking.

UNIT II  DESIGNING E-LEARNING CONTENT / COURSE  9

Suggested Activities:
- Preparation of Concept Map
- Discussion forum – design models.
- External learning - E-learning instructional methods.

Suggested Evaluation Methods:
- Assignment on design models of multimedia E-learning.
- Quiz on E-Learning instructional methods.

UNIT III  CREATING INTERACTIVE E- CONTENT  9

Suggested Activities:
- Discussion forum on creation of multimedia storyboards.
- External learning on types of authoring tools.

Suggested Evaluation Methods:
- Assignment on multimedia story boards creation.
- Quiz on authoring tools.
UNIT IV LEARNING PLATFORMS


Suggested Activities:
- Design of CMS using FOSS framework
- Course and User Administration
- Resource and Activities scheduling in LMS
- Plugin Management
- Report Generation

Suggested Evaluation Methods:
- Assignment on proprietary and open source LMS.
- Quiz on LMS solutions.

UNIT V COURSE DELIVERY AND EVALUATION


Suggested Activities:
- Discussion on planning and documentation.
- External learning - Evaluation and delivery methods.

Suggested Evaluation Methods:
- Assignment on planning an documentation.
- Quiz on evaluation and delivery methods.

TOTAL : 45 PERIODS

OUTCOMES
- Distinguish the phases of activities in models of E-learning
- Identify appropriate E-Learning instructional methods and delivery strategies
- Choose appropriate E-learning Authoring tools
- Create interactive E-Learning courseware
- Evaluate the E-learning courseware

REFERENCES

LE5105       RESEARCH METHODOLOGY AND IPR       L T P C
            2 0 0 2

OBJECTIVES
    ●   To identify the problem and analyze the solutions.
    ●   To write a technical paper and presentation
    ●   To formulate patent drafting and filing patents.

UNIT I     RESEARCH PROBLEM FORMULATION       6
Meaning of research problem- Sources of research problem, criteria characteristics of a good research
problem, errors in selecting a research problem, scope and objectives of research problem. Approaches
of investigation of solutions for research problem, data collection, analysis, interpretation, necessary
instrumentations

UNIT II    LITERATURE REVIEW                   6
Effective literature studies approaches, analysis, plagiarism, and research ethics.

UNIT III   TECHNICALWRITING/PRESENTATION      6
Effective technical writing, how to write report, paper, developing a research proposal, format of
research proposal, a presentation and assessment by a review committee

UNIT IV    INTRODUCTION TO INTELLECTUAL PROPERTY RIGHTS (IPR)       6
Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and
Development: technological research, innovation, patenting, development. International Scenario:
International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT

UNIT V     INTELLECTUAL PROPERTY RIGHTS (IPR)       6
Patent Rights: Scope of Patent Rights. Licensing and transfer of technology. Patent information and
of Biological Systems, Computer Software etc.
Traditional knowledge Case Studies, IPR

TOTAL :30 PERIODS

OUTCOMES
1. To formulate research problem
2. To carry out research analysis
3. To follow research ethics and Integrity
4. To formulate patent on IPR and filing patents in R &D.

REFERENCES
The Educational Technology lab course will help students in understanding tools useful for creating online learning content, online assessment, using visualization, analyzing data, etc.

**PRACTICAL EXERCISES:**

**E-Content Development**

1. Concept Mapping Tools: e.g. CMAP, MindMap, Freemind
2. Graphics and Animation Tools: GIMP, Blender
3. Camstudio for screencast, image editing, audio editing (audacity), video management, etc.
4. Assessment Tools like Hot Potato
5. Online Collaboration Tools: e.g. Wiki

**Learning Management System: MOODLE**

1. Creation of Users and Schedule users Vs Courses in Moodle.
2. Preparation and Organization of Multimedia Course Contents in Moodle.
3. Aligning the course objectives, Assessments and evaluation methods of Courseware in Moodle.
4. Courseware Content generation with various Multimedia instructional formats.
5. Adding communication tools in Moodle for effective collaboration.
6. Creation of instructor led courses in Moodle.
7. Creation of self-Learning courses in Moodle.
8. Implementation of various Evaluation strategies of Courseware in Moodle.
9. Implementation of various delivery strategies in Moodle.

TOTAL: 30 PERIODS

**LE5201 LEARNING ANALYTICS**

**OBJECTIVES**

- To know how to derive meaning from huge volume of data and information
- To understand how knowledge discovering process is used in educational decision making.
- To acquire knowledge about the techniques of analysing student learning data.
- To practice of data pre-processing techniques to analyse student performance
- To learn application of models to the educational datasets.
- To take appropriate decisions based on the analytics data to meet the institutional vision and mission

**UNIT I INTRODUCTION TO LEARNING ANALYTICS IN EDUCATION**

Learning analytics in Education - Challenges in the adoption of Learning Analytics in Education - Benefits for Stakeholders - Learning analytics Policies - Learning analytics for Quality Assurance - Data Collection – How Big is Education data- Data Collection from Learning Environment - Pre-Processing - Ethics and privacy issues

**UNIT II EDUCATIONAL DATA MINING**

Educational Data mining – Data from Learning Management System - Data preprocessing and preparation – Student Discussion forum - Text mining – Web mining – Spatial mining – Process mining Relationship mining models and techniques
UNIT III  DESCRIPTIVE ANALYTICS  12
Introduction to Descriptive analytics – Collection of data through Questionnaire – Stakeholder participation (Students, teachers, parents, industries and etc..) in collecting data - Visualizing and Exploring Data - Descriptive Statistics - Sampling and Estimation - Probability Distribution for Descriptive Analytics

UNIT IV  PREDICTIVE MODELING  14
Introduction to Predictive analytics - Predictive models vs. explanatory models - The predictive modeling lifecycle - Predictive models of student success - Ethical considerations with predictive models – educational predictive models - Supervised machine learning techniques - including Decision Trees and Naive Bayes - Model evaluation and comparison

UNIT V  PRESCRIPTIVE ANALYTICS  12
Introduction to Prescriptive analytics - Prescriptive Modeling - Non Linear Optimization – Analysis of Educational Institution Performance - Decision making

TOTAL : 60 PERIODS

OUTCOMES
- Analyse, plan, and deploy a small learning analytics pilot, including the intent of LA
- Evaluate current state of learning analytics technologies and describe the benefits and drawbacks to open source and proprietary tool sets.
- Apply various data mining techniques into various areas of different domains.
- Explore the basics of data mining processes, algorithms, & systems.
- Apply various prediction techniques.
- Use different supervised and unsupervised learning technique to classify and cluster educational data.

REFERENCES
3. G. K. Gupta, Ÿntroduction to Data mining with Case Studies, Prentice hall of India,2011

LE5202  MIXED REALITY  L T P C
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OBJECTIVES
- To impart the fundamental aspects and principles of mixed reality technologies.
- To know the internals of the hardware and software components involved in the development of mixed reality enabled applications.
- To learn about the graphical processing units and their architectures.
- To gain knowledge about mixed reality application development.
- To know the technologies involved in the development of mixed reality based applications.

UNIT I  INTRODUCTION  9
– Components of VR System – Introduction to AR-AR Technologies-Input Devices – 3D Position
Trackers –Performance Parameters – Types of Trackers – Navigation and Manipulation Interfaces –
Auditory System.

Suggested Activities:
- Flipped classroom on uses of MR applications.
- Videos – Experience the virtual reality effect.
- Assignment on comparison of VR with traditional multimedia applications.

Suggested Evaluation Methods:
- Tutorial – Applications of MR.
- Quizzes on the displayed video and the special effects

UNIT II MR COMPUTING ARCHITECTURE
Infinite Reality Architecture – Distributed VR Architectures – Multi-pipeline Synchronization – Collocated
Rendering Pipelines – Distributed Virtual Environments-MR architecture.

Suggested Activities:
- Flipped classroom on basic graphics pipeline.
- External learning – Different types of Graphics architectures and workstations.
- Practical – GPU programming.

Suggested Evaluation Methods:
- Tutorial – Graphics pipelines.
- Brainstorming session on GPU architecture.
- Quizzes on graphical architectures.
- Demonstration on GPU related simple modeling and rendering programs

UNIT III MR MODELING
Modeling – Geometric Modeling – Virtual Object Shape – Object Visual Appearance – Kinematics
– Viewing the 3D World – Physical Modeling – Collision Detection – Surface Deformation – Force

Suggested Activities:
- Flipped classroom on modeling three dimensional objects.
- External learning – Collision detection algorithms.
- Practical – Creating three dimensional models.

Suggested Evaluation Methods:
- Tutorial – Three dimensional modeling techniques.
- Brainstorming session on collision detection algorithms.
- Demonstration of three dimensional scene creation.

UNIT IV PROGRAMMING AND APPLICATIONS
VR Programming – Toolkits and Scene Graphs – World Toolkit – Java 3D – Comparison of World
Toolkit and Java 3D – GHOST – People Shop – Human Factors in VR – Methodology and Terminology

**Suggested Activities:**
- External learning – Different types of programming toolkits and Learn different types of available VR applications.
- Practical – Create VR scenes using any toolkit and develop applications.

**Suggested Evaluation Methods:**
- Tutorial – VR tool comparison.
- Brainstorming session on tools and technologies used in VR.
- Demonstration of the created VR applications

**UNIT V  MIXED REALITY TECHNOLOGIES 9**

**Suggested Activities:**
- External learning – Different types of sensing and tracking devices for creating mixed reality environments.
- Practical – Create MR scenes using any toolkit and develop applications.

**Suggested Evaluation Methods:**
- Tutorial – Mobile Interface Design.
- Brainstorming session on wearable computing devices and games design.
- Demonstration and evaluation of the developed MR application.

**TOTAL : 45 PERIODS**

**OUTCOMES**
On completion of the course, the students will be able to:
- Demonstrate the understanding of the basic concepts of Mixed Reality
- Use the tools and technologies related to Mixed Reality
- Develop the Virtual Reality applications in different domains
- Design of various models using modeling Techniques
- Implement the concept of Virtual Reality and Mixed Reality Programming with Toolkits.

**REFERENCES**
1. Charles Palmer, John Williamson, “Virtual Reality Blueprints: Create compelling VR experiences for mobile”, Packt Publisher,2018
OBJECTIVES

- To know the basics of 2D and 3D graphics for game development.
- To know the stages of game development.
- To understand the basics of game engine.
- To survey the gaming development environment and tool kits.
- To learn and develop simple games using Pygame environment.

UNIT I 3D GRAPHICS FOR GAME DESIGN 9


Suggested Activities:
- Discussion about computer and video games origin and history.
- Discussion of graphics objects, open source language for game development like Pygame and Processing.py – a Language for creative arts.
- External learning – Algorithms in translation, scaling, zooming and rotation of 3D objects.
- Practical – Installation of Pygame and Pygame Zero and Implementation of colour models and shading models in Python.

Suggested Evaluation Methods:
- Tutorial – 2D and 3D transformations.
- Practical – Programming exercises in animations.
- Assignments on image projections and colour models.
- Quizzes on 2D and 3D Game Object transforms.

UNIT II GAME DESIGN PRINCIPLES 9


Suggested Activities:
- Flipped classroom on animation.
- Practical – Creation of game script.
- External learning – Problems on game level design.
- Assignment on preparation of game level design document, detailed document.

Suggested Evaluation Methods:
- Tutorial – Scriptwriting.
- Assignments on game proposal writing.
- Quizzes on game design document.

UNIT III GAME ENGINE DESIGN 9

Suggested Activities:
- Flipped classroom on rendering.
- External learning – Problems on rendering and animation.
- Practical – Implementation of simple animations in Pygame and Processing.py

Suggested Evaluation Methods:
- Tutorial – Collision detection.
- Assignments on game AI and pathfinding.
- Quizzes on rendering.

UNIT IV OVERVIEW OF GAMING PLATFORMS AND FRAMEWORKS

Pygame Game development – Unity – Unity Scripts – Mobile Gaming, Game Studio, Unity Single player and Multi-Player games.

Suggested Activities:
- Flipped classroom on gaming environments.
- External learning – Problems on Installation of Unity and scripts.
- Practical – Pygame routines for character rendering, transformations and sound processing.

Suggested Evaluation Methods:
- Tutorial – Mobile gaming.
- Assignment on game logic.
- Quizzes of all topics related to Unity and Pygame.

UNIT V GAME DEVELOPMENT USING PYGAME


Suggested Activities:
- External learning – Writing Unity scripts and assets.
- Practical – Implementation of simple games.

Suggested Evaluation Methods:
- Tutorial problems in 2D and 3D graphics Programming.
- Practical – Programming problems like asset creation.
- Quizzes on game development in Pygame.

TOTAL : 45 PERIODS

OUTCOMES
- Explain the concepts of 2D and 3D graphics
- Design game design documents.
- Implementation of gaming engines.
- Survey gaming environments and frameworks.
- Implement a simple game in Pygame.
REFERENCES:

LE5204 SHORT FILM DEVELOPMENT

OBJECTIVES
● To understand the fundamentals of Short Film Making.
● To know the working principles camera.
● To acquire knowledge about the editing software.
● To train the student as a member or leader in diverse teams of short film development.
● To inculcate aesthetic sense involved in creativity and transform creative ideas into short-film.

UNIT I INTORODUCTION TO SHORT FILM
Introduction – Different Types of Short Film – Documentary and Non Fiction Film – Animated Short Films – Challenges in Developing Short Films – Creative Approaches.

Suggested Activities:
● Blended Learning – Displaying Different types short films.
● Flipped classroom on issues in short film production.
● External learning – Practical problems related to interacting with people related public issues.

Suggested Evaluation Methods:
● Assignment on different types of short film.
● Tutorial – Various issues related to short films production.
● Assignment on different interviews style.

UNIT II PREPRODUCTION

Suggested Activities:
● Blended learning – People interest towards short films.
● Flipped classroom on discussion on selection of crew members based on their talents.
● External learning – Survey on funding agencies and legal details regarding short films productions.
Suggested Evaluation Methods:
- Assignment on preparing survey question to known people interest towards short film.
- Tutorial – Crew and their responsibilities.
- Assignment on project proposal preparation.

UNIT III PRODUCTION

9

Suggested Activities:
- Blended learning – Research regarding the locations and pervious stories.
- Flipped classroom on different types of cameras.

Suggested Evaluation Methods:
- Quizzes on research and scheduling the locations.
- Assignment on the usage of cameras in shooting procedures.

UNIT IV POST PRODUCTION

9

Suggested Activities:
- Flipped classroom on various visual and color effects.
- External learning – Interaction with media peoples.

Suggested Evaluation Methods:
- Tutorial – Color theory.
- Assignment on recording and editing.

UNIT V SCREENING

9
Impact of Short Film on the Society – Various Media Techniques used in Short Film Production – Identifying Important Current Social Issues for Short Film – Exploring Background Research Current Social Issues – Making Short Film for Television and Theatrical Release – Non Fiction Presentation – Production of an individually or Group Authored Short Film Based on Historical – Corporate – Institutional – Current Social Issues.

Suggested Activities:
- External learning – Survey on current public issue.
- Flipped classroom on discussion on innovative short film production.

Suggested Evaluation Methods:
- Quizzes on public issues.
- Tutorial – Various new techniques in short film production.

TOTAL: 45 + 30 = 75 PERIODS

OUTCOMES
- Apply the knowledge of concepts and techniques used in short film development.
- Understand the social issues and projecting them effectively through short film.
- Conduct various experiments for effective short film.
● Design and implement various techniques in to short film that brings impact on the society.
● Apply various tools and software for lighting and sound to uphold the professional and social obligation.
● Manage and Develop a short film as a life-long activity as a team.

REFERENCES


LE5211 GAME PROGRAMMING AND MIXED REALITY LABORATORY

GAME PROGRAMMING
1. Implement a small avatar in Pygame/Unity.
2. Implement a canvas and colour models in Pygame/Unity.
3. Implement a Lighting and Shade model in Pygame/Unity.
4. Write a Proposal document for a Game.
5. Write a Game Level design document and detailed document.
7. Implement Pygame routines for Character rendering and transformations.
8. Implement routines for creation and playing of Sounds in Pygame.
9. Implement a simple game logic.
10. Implement a simple Tile game using Pygame/Unity.

MIXED REALITY
1. Study of tools like Unity, Maya, 3DS MAX, AR toolkit, Vuforia and Blender.
2. Use the primitive objects and apply various projection methods by handling camera.
3. Download objects from asset store and apply various lighting and shading effects.
4. Model three dimensional objects using various modelling techniques and apply textures over them.
5. Create three dimensional realistic scenes and develop simple virtual reality enabled mobile applications which have limited interactivity.
6. Add audio and text special effects to the developed application.
7. Develop VR enabled applications using motion trackers and sensors incorporating full haptic interactivity.
8. Develop AR enabled applications with interactivity like E learning environment, Virtual walkthroughs and visualization of historic places.
10. Develop simple MR enabled gaming applications.

TOTAL: 60 PERIODS
OBJECTIVES

- To understand the basics of python programming structure
- To use control structures, looping structures and functions
- To practice object oriented concepts in python
- To write a game program using python pygame

UNIT I  PYTHON BASICS


UNIT II  PYTHON OPERATORS AND FUNCTIONS


UNIT III  PYTHON OBJECT ORIENTED PROGRAMMING AND PACKAGES


UNIT IV  PYTHON FILES AND THREAD


UNIT V  PYTHON GAME PROGRAMMING

PyGame Concepts - Initialization and Modules - Displays and Surfaces - Importing and Initializing PyGame - Setting Up the Game Loop - Processing Events - Drawing on the Screen - Using .blit() and .flip() – Sprites – Players - User Input – Enemies - Sprite Groups - Custom Events - Collision Detection - Sprite Images -Altering the Object Constructors -Adding Background Images -Game Speed - Sound Effects

OUTCOMES

- To use control structures in the programming
- To design program with object oriented features
- To import and use packages in the programming
- To access and modify files
- To write a python game program with pygame packages

REFERENCES

OBJECTIVES

● Understand the basics of Educational Psychology
● Comprehend the stages of growth and development
● Comprehend the factors influencing learning
● Develop awareness on the influence of intelligence and creativity
● Comprehend the aspects of Motivation and Personality

UNIT I INTRODUCTION TO EDUCATIONAL PSYCHOLOGY

Educational Psychology - Definition, meaning, scope and relevance of Educational Psychology – Schools of thought - Methods of Studying Behavior - Introspection, Observation and Experimental method

UNIT II CHARACTERISTICS OF LEARNERS

Growth and Development – Meaning, stages; Physical, Mental, Emotional and Social Development during childhood, adolescence - Individual Differences - Meaning, significance and causes.

UNIT III TEACHING LEARNING PROCESS


UNIT IV INTELLIGENCES

Intelligence - Concept – Theories - Gardner’s Theory of Multiple Intelligence – Measurement of Intelligence - Creativity - concept, characteristics - educational implications.

UNIT V STUDENT MOTIVATION AND PERSONALITY

Motivation – Theories, Models - Strategies - Personality - Self concept, Self Esteem - Theories of Personality – Personality assessment - Group dynamics – Sociometry

TOTAL: 45 PERIODS

OUTCOMES

● Demonstrate the understanding the basics of Educational Psychology
● Explain the stages of growth and development
● Identify the factors influencing learning
● Develop awareness on the influence of intelligence and creativity
● Implement Motivation strategies for learning in designing and delivering the course

REFERENCES

LE5003  DIGITAL MARKETING

L  T  P  C
3  0  0  3

OBJECTIVES

- To create new opportunities for businesses to reach and engage consumers through smart, social, and mobile media technologies.
- To understand the impacts of digital technologies on marketing communication strategies and practices.
- To strategically select the appropriate channels to deliver the right marketing message to the right audience at the right moment.

UNIT I  INTRODUCTION TO DIGITAL MARKETING AND SEO  9

UNIT II  SEARCH MARKETING AND WEB SITE ANALYTICS  9
Campaign Management - Conversion Tracking - Targeting & Analytics - Keyword Selection - Conversion Metrics: CPA, CTR - Goal Configuration & Funnels - Intelligence Reporting - Conversions, Bounce Rate, Traffic Sources, Scheduling

UNIT III  SOCIAL MEDIA MARKETING  9
Monitoring and Control, Project Status Reporting; Project Metrics; Earned Value Analysis (EVA); What is Social Media Marketing? - Overview of Facebook, Twitter, LinkedIn, Blogging, Youtube and Flickr - Building Brand Awareness Using Social Media - Social Media Management - Insights and Analytics – Revenue optimization tools – SEO & SEM – Ad text optimization – Best Practice Examples & case Studies

UNIT IV  EMAIL AND MOBILE MARKETING  9

UNIT V  DISPLAY ADVERTISING AND STRATEGIC PLANNING  9
Tracking your Campaign - Optimizing the Campaign - Campaign Planning - Running Effective Ads - Situation Analysis, Planning, Budget, Measurement - Information Gathering & Research - Key Strategy & Planning Concepts & Methodologies - Best Practice Case Studies

TOTAL: 45 PERIODS

OUTCOMES

- Demonstrate the understanding of social media, the various channels through which it operates, and its role in marketing strategy
- Use principles of consumer and social psychology to develop social media content and campaigns that engage consumers
- Draw on knowledge about word-of-mouth marketing to develop effective approaches for propagating ideas, messages, products, and behaviors across social networks
- Measure the impact of a social media campaign in terms of a specific marketing objective
OBJECTIVES:

- Understand concepts of Training and Development
- Comprehend the training Process
- Comprehend the design and implementation of training
- Understand Evaluation of training

UNIT I INTRODUCTION TO TRAINING CONCEPT
Introduction to Training Concept: Definition, Meaning, Need for Training, Importance of Training, Objectives of Training, Concepts of Education, Training and Development, Overview of Training Functions, Types of Training

UNIT II PROCESS OF TRAINING

UNIT III DESIGNING AND IMPLEMENTING A TRAINING PROGRAM
Designing and Implementing a Training Program: Trainer Identification, Methods and Techniques of Training, Designing a Training Module (Cross Cultural) Leadership, Training the Trainer, Change, Management Development Program, Budgeting of Training.

UNIT IV EVALUATION OF TRAINING PROGRAM

UNIT V

TOTAL: 45 PERIODS
OUTCOMES:

- Explain the role of training and development in human resources management.
- Describe the psychology of the learning process on which training is based.
- Analyze the training needs of an organization.
- Assess, design, access and implement various methods, techniques and sources of training.
- Evaluate the value of the training once completed from the individual employee and the organization's viewpoint.

REFERENCES:

1. Tapamoy Deb (2009), Training and Development. New Delhi : ANE Books

LEARNING SCIENCE

OBJECTIVES

- To introduce major epistemic, theoretical positions and research approaches in learning sciences.
- To understand cognitive and social perspectives on learning, concepts and approaches to learning environment.
- To design that focuses on interaction and authentic practices for learners.

UNIT I INTRODUCTION TO LEARNING SCIENCES


UNIT II KNOWLEDGE AND EPISTEMOLOGICAL BELIEFS

Knowledge structures and processes – A theoretical framework and approach for fostering metacognitive development – Epistemological understanding as a metacognitive process: Thinking aloud during online searching – The framework theory approach to the problem of conceptual change – Knowledge in Pieces – Knowledge outside of the head – The extended mind

UNIT III VIEWS OF LEARNING


UNIT IV MOTIVATION AND ENGAGEMENT

Motivation – Social cognitive approach to motivation and personality – Achievement goal orientations and identity formation styles. Towards a theory of personalized learning communities - Designs for learning environments of the future – Four Phase model of interest development – Learning environments and design approaches aligned with situated view of learning

TOTAL: 45 PERIODS

OUTCOMES

- Demonstrate a basic understanding of the main contemporary learning theories
- Apply a subset of these theories based on a more in-depth understanding
- Describe the current state of the art in educational technology
- Use a number of educational technologies for group learning
- Apply concepts form the learning and communication sciences to assess the potentials and problems of technological developments
- Implement ideas from conceptual knowledge in the design of learning experiences

REFERENCES


LE5006 MULTIMEDIA DATABASES

OBJECTIVES

- To understand about the database storage, retrieval of multimedia elements.
- To familiarize about the database indexing methods and different multidimensional data structures.
- To learn about text database and image database storage and retrieval.
- To understand design and architecture of a Multimedia Database.
- To understand about Audio and Video Storage.

UNIT I DATABASE INDEXING METHODS


Suggested Activities

- Flipped classroom on traditional databases.
• External learning - Comparison of different data structures and its usage.
• Practical - Application development using multi-dimensional data structures.

Suggested Evaluation Methods
• Assignments on hashing mechanisms
• Tutorials - Indexing and access methods.
• Demonstration of the application development.

UNIT II TEXT DATABASES


Suggested Activities
• Flipped classroom on text databases.
• External learning - Comparison of other retrieval techniques for text databases and its usage.
• Practical - Application development in text databases.

Suggested Evaluation Methods
• Assignments on information retrieval techniques.
• Tutorials - Access methods for text databases.
• Demonstration of the practical implementation.

UNIT III IMAGE RETRIEVAL MECHANISMS


Suggested Activities
• Flipped classroom on image databases.
• External learning – Retrieving Images.
• Practical - Application development in image databases.

Suggested Evaluation Methods
• Assignments on image retrieval mechanisms.
• Tutorials - R-trees.
• Demonstration of the practical implementation.

UNIT IV AUDIO/VIDEO DATABASES


Suggested Activities
• Flipped classroom on audio/video databases.
• External learning - Capturing and querying audio and video content.
• Practical - Application development in video databases.

Suggested Evaluation Methods
• Assignments on capturing audio/ video content.
• Tutorials - Indexing audio/video databases.
• Demonstration of the practical implementation.
UNIT V MULTIMEDIA DATABASE DESIGN


Suggested Activities
- Flipped classroom on text databases.
- External learning - Query languages for retrieving multimedia data.
- Practical – Application development.

Suggested Evaluation Methods
- Assignments on organizing multimedia data.
- Tutorials - Query languages for retrieving multimedia data.
- Demonstration of the practical implementation

TOTAL: 45 PERIODS

OUTCOMES
- Demonstrate the multidimensional data structures for multimedia applications
- Apply database indexing methods for efficient storage and retrieval of multimedia content.
- Work with Text databases, its storage and retrieval.
- Formulate and generalize the use of audio and video databases for real time multimedia applications.
- Demonstrate about Image database, its storage and retrieval.
- Apply multimedia database design for multimedia architecture.

REFERENCES
UNIT -II  PROJECT PLANNING  10
Project Planning Activities- Project Scope, Work Breakdown Structures (WBS), Software estimation methodologies - COCOMO Model and Function Point
Project Scheduling Techniques – Program Evaluation and Review Technique (PERT), Gantt Chart and Critical Path Method (CPM)

UNIT -III  PROJECT TRACKING  10
Monitoring and Control, Project Status Reporting; Project Metrics; Earned Value Analysis (EVA); Project Communication Plan & Techniques; Steps for Process Improvement.
Risk Management: Concepts of Risks and Risk Management; Risk Management Activities; Effective Risk Management; Risk Categories; Aids for Risk Identification; Potential Risk Treatments; Risk Components and Drivers; Risk Prioritization.

UNIT -IV  PROJECT CLOSURE  8
Project Closure Analysis, Lesson Learnt

UNIT - V  AGILE PROJECT MANAGEMENT WITH SCRUM  9
Agile Manifesto and Agile Principles

TOTAL:45 PERIODS

OUTCOMES
At the end of this course, student should be able to:
● Identify the different project contexts and suggest an appropriate management strategy.
● Practice the role of professional ethics in successful software development.
● Identify and describe the key phases of project management.
● Determine an appropriate project management approach through an evaluation of the business context and scope of the project.
● Apply a thorough understanding of Agile principles and specific practices

REFERENCES
7. Bernie Trilling, Walter Ginevri, Project Management for Education: The Bridge to 21st Century Learning, Publisher(s): Project Management Institute, October 2017
ONLINE RESOURCES:
- http://agilemanifesto.org/
- https://www.scrum.org/Resources/What-is-Scrum
- http://www.scrumguides.org/scrum-guide.html#purpose

LE5008 KNOWLEDGE ENGINEERING AND MANAGEMENT

OBJECTIVES:
- Understand the various KM models and tools
- Develop awareness on Knowledge capture and sharing
- Comprehend the various Knowledge management tools
- Appreciate the importance of organizational culture in KM
- Develop Knowledge on the roles and responsibility of KM Team

UNIT I OVERVIEW OF KNOWLEDGE MANAGEMENT

UNIT II TECHNOLOGIES TO MANAGE KNOWLEDGE

UNIT III KNOWLEDGE MANAGEMENT LIFE CYCLE
Challenges in KM Systems Development, Conventional Vs KM Systems Life Cycle (KMSLC), Key Differences, Key Similarities, KMSLC Approaches, Knowledge Creation, Nonaka’s Model of Knowledge Creation & Transformation, Knowledge Architecture, Acquiring the KM System.


UNIT IV KNOWLEDGE CODIFICATION
Modes of Knowledge Conversion, Codifying Knowledge, Codification Tools/Procedures: Knowledge Maps, Decision Table, Decision Tree, Frames, Production Rules, Case-Based Reasoning, Knowledge-Based Agents, Knowledge Developer’s Skill Set, Knowledge Requirements, Skills Requirements, Learning from Data: The Concept of Learning, Data Visualization, Neural Network (Artificial) as Learning Model, Supervised/Unsupervised Learning, Applications in Business, Relative Fit with KM, Association Rules, Classification Trees.

UNIT V KNOWLEDGE BASE SYSTEMS
OUTCOMES:

- Identify the types of knowledge and structure of knowledge management solutions
- Apply appropriate tool for information and knowledge visualization, representation and structuring
- Analyse and evaluate: organizational impacts of KM, factors influencing KM
- Implement knowledge management using coding strategy
- Apply concepts and tools of semantic modelling, knowledge reasoning and lateral reasoning in realization of KM solutions

REFERENCES:


LE5009 WEB DESIGN

OBJECTIVES

- To understand the HTML5 tags and design page using HTML5
- To Integrate CSS in HTML page
- To devise layout using boostrap functions
- To write javascript program in the webpage design
- To enable JQuery UI in the web page

UNIT – I HTML5

What is Markup Language - Basic Structure of HTML - Head Section and Elements of Head Section - Meta Tags -CSS Tags - Script Tag - Table Tag - Div Tag - Header Tags - Paragraph, Span, Pre Tags - Anchor Links and Named Anchors - Image Tag - Object Tag - Iframe Tag - Introduction to HTML5 - New Structure Tags - Section – Nav – Article – Aside – Header – Footer - Designing a HTML - Structure of Page - New Media Tags - Audio Tag - Video Tag - Canvas and Svg Tag 0 Placeholder Attribute - Require Attribute - Pattern Attribute - Autofocus Attribute - email , tel, url types -umber type - date type - range type - voice search

UNIT – II CSS3

UNIT – III  WEB DESIGN WITH BOOTSTRAP


UNIT – IV  JAVASCRIPT


UNIT – V  JQUERY UI AND HOSTING

Web Hosting Basics - Types of Hosting Packages - Registering domains - Defining Name Servers - Using FTP Client - Maintaining a Website

TOTAL: 45+30=75 PERIODS

OUTCOMES

● Use HTML tags in the designing responsive pages
● Integrate CSS into HTML pages
● Prepare a layout using bootstrap functionalities
● Write javascript to implement event programming
● Use Jquery for responsive pages
● Host a site in a public environment

LIST OF EXPERIMENTS

Create dynamic web pages using CSS, JavaScript and AJAX
1. Develop mobile based web applications in cloud environment.
2. Simple GUI application development using applet and SWING.
3. Develop servlet and JSF application with JDBC access.
4. Android application for location based service.
5. Develop cloud based web application.
6. Deploy web applications in a cloud based environment

REFERENCES

3. HTML and CSS: Design and Build Websites By Jon Duckett, Wiley Publications, 2016

LE5010 MULTIMEDIA RETRIEVAL TECHNIQUES

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 use of machine learning methods on multimedia collections.
• To critically evaluate Multimedia retrieval system effectiveness and improvement techniques.

UNIT - I  STORAGE AND PRESENTATION OF MULTIMEDIA


Suggested Activities:
• Install openCV and learn the functions which are used for Image retrieval.

Suggested Evaluation Methods:
• Quiz on applications of data structure

UNIT - II  TEXT AND MUSIC RETRIEVAL


Suggested Activities:
• Compute the tf-idf weights for the terms car, auto, insurance, best for each document, using the idf values from Figure.

<table>
<thead>
<tr>
<th></th>
<th>Doc1</th>
<th>Doc2</th>
<th>Doc3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>27</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>Auto</td>
<td>3</td>
<td>33</td>
<td>0</td>
</tr>
<tr>
<td>Insurance</td>
<td>0</td>
<td>33</td>
<td>29</td>
</tr>
<tr>
<td>Best</td>
<td>14</td>
<td>0</td>
<td>17</td>
</tr>
</tbody>
</table>

Consider the query best car insurance on a fictitious collection with N=1,000,000 documents where the document frequencies of auto, best, car and insurance are respectively 5000, 50000, 10000 and 1000. Compute the cosine similarities between the query vector and each document vector in the collection

Suggested Evaluation Methods:
• Discussion on applying various tf-idf variant and similarity measurements and comparing the results.

Unit - III  IMAGE RETRIEVAL


Suggested Activities:
• Assignment on numerical problems on feature extraction techniques.

Suggested Evaluation Methods:
• Tutorial – MPEG-7 standards.
• Tutorial on the problem of choosing the features to be extracted for a large image collection.
UNIT - IV VIDEO RETRIEVAL


Suggested Activities:
- External learning – Survey on colour-based tracking and optical flow.
- Practical – Learn any open source database software for database operations.

Suggested Evaluation Methods:
- Demonstration and quiz on the practical exercise and the EL component.

UNIT - V RETRIEVAL METRICS AND TRENDS


Suggested Activities:
- External learning – Survey on image and video retrieval processing in a search engine such as Google, Yahoo and Bing.

Suggested Evaluation Methods:
- Group discussion and quiz on EL component.
- Assignment on various metric calculations.

Practical (30)
Implement the following exercises using OpenCV:
1. Develop a system to compute that representation for each of the images in a database and to change images between different colour spaces, transformations, about Contours (4hr)
2. Develop a system to search for an object in an image using Template Matching and segment images and extractions of foreground (4hr)
3. Implement to do the pre-processing for any document and construct a vector space model for the collection of text documents and also compute the similarity between them. (4hr)
4. Develop a system to compute spatial-temporal motion trajectory for a video dataset. (4hr)
5. Develop a system to compute any two Feature extraction techniques and dimension reduction procedure. (4hr)

TOTAL:45+30=75 PERIODS

OUTCOMES
- Explain the basics of multimedia information storage technology, techniques for analysis, representation and retrieval.
- 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.
- Implement the process by exploring the open source tool for Image retrieval and video retrieval.
- Recognize the feasibility of applying machine learning for a particular problem.
- Critically evaluate Multimedia retrieval system effectiveness and improvement techniques.
REFERENCES

LE5011 MOBILE APPLICATION DEVELOPMENT PRACTICES

OBJECTIVES
- Understand system requirements for mobile applications
- Generate suitable design using specific mobile development frameworks
- Generate mobile application design
- Implement the design using specific mobile development frameworks
- Deploy the mobile applications in market place for distribution.

UNIT - I INTRODUCTION
Introduction to mobile applications – Embedded systems - Market and business drivers for mobile applications – Publishing and delivery of mobile applications – Requirements gathering and validation for mobile applications.

UNIT - II BASIC DESIGN
Introduction – Basics of embedded systems design – Embedded OS - Design constraints for mobile applications, both hardware and software related – Architecting mobile applications – User interfaces for mobile applications – touch events and gestures – Achieving quality constraints – performance, usability, security, availability and modifiability

UNIT – III ADVANCED DESIGN
Designing applications with multimedia and web access capabilities – Integration with GPS and social media networking applications – Accessing applications hosted in a cloud computing environment – Design patterns for mobile applications.

UNIT - IV ANDROID

UNIT - V IOS
Introduction to Objective C – iOS features – UI implementation – Touch frameworks – Data persistence using Core Data and SQLite – Location aware applications using Core Location and Map Kit – Integrating calendar and address book with social media application – Using Wifi - iPhone marketplace.
Practical
- Develop an application that uses GUI components, Font and Colours
- Develop an application that uses Layout Managers and event listeners.
- Develop a native calculator application.
- Write an application that draws basic graphical primitives on the screen.
- Develop an application that makes use of database.
- Develop an application that makes use of RSS Feed.
- Implement an application that implements Multi threading
- Develop a native application that uses GPS location information.
- Implement an application that writes data to the SD card.
- Implement an application that creates an alert upon receiving a message.
- Write a mobile application that creates an alarm clock

TOTAL: 45+30=75 PERIODS

OUTCOMES
- Describe the requirements for mobile applications
- Explain the challenges in mobile application design and development
- Develop design for mobile applications for specific requirements
- Implement the design using Android SDK
- Implement the design using Objective C and iOS
- Deploy mobile applications in Android and iPhone marketplace for distribution

REFERENCES

LE5012 DESIGN AND DEVELOPMENT OF MOOC

OBJECTIVES
- The objective of this course is to develop an effective, efficient and impactful Massive Open Online Course material and to create a satisfying teaching and learning experience

UNIT - I INTRODUCTION TO OPEN EDUCATION
Precursors of MOOC: OER, MIT OCW, Open University, Open course, Open source software, Open Philosophy, Timeline of MOOC Online Education Trends: MOOCS -About MOOCs, Why MOOCs, Structure of MOOC, Types of MOOCs, Success testimonials of MOOCs

UNIT -II MOOC PLATFORMS
Best MOOCs platforms, Functions of MOOCs platforms, Site Analysis, Comparative Analysis –MOOC Providers - Coursera, edX, Udemy, SWAYAM
UNIT III  MOOC FRAMEWORK AND PEDAGOGY


UNIT IV  BEST PRACTICES FOR MOOCS DEVELOPMENT

Templates, Questionnaire and surveys to identify target group, design course prototype, Use of course planner - assign tasks and responsibilities, Quality dimension review, Tools for the development of Complex Equations, Charts and Graphs, Creation of professional-quality images and videos for more effective MOOCs, IPR issues, Copyrights and Owning rights etc., use of OERs

MOOCs Preproduction process, MOOCs Production process and MOOCs Post production process, MOOCs Storyboard, Create Multimedia, Editing Images, Editing Videos, create presentation, possible roles of MOOCs development team

UNIT V  CREATE MOOC COURSES

MOOC Technology - Open MOOC platform – Open edX, Course Builder - Create instructor-led courses, degree programs, and self-paced courses.

TOTAL: 45 + 30 = 75 PERIODS

1. Formulate the course template for MOOC
2. Design and develop Learner Centric E-content for a course
3. Design and develop Assessment tools and techniques (formative assessment, Evaluation, Group Work, Peer to Peer Evaluation)
4. Create and publish a MOOC course on Course builder/OpenedX
5. Prepare reports of Learning Analytics

OUTCOMES

- Demonstrate the understanding of Open philosophy and OER
- Design and Develop Instructional Materials and assessment tools based on MOOC Pedagogy
- Appraise MOOCs best practices
- Develop quality and effective MOOCs

REFERENCES

1. Distributed Learning: Pedagogy and Technology in Online Information Literacy Instruction 1st Edition, Kindle Edition , by Tasha Maddison (Editor), Maha Kumaran (Editor)
2. https://www.elearninglearning.com/online-learning/pedagogy/
3. https://www.tonybates.ca/2016/12/01/5-ideas-for-a-pedagogy-of-online-learning/topographical
   Sung-Wan Kim (December 14th 2016).
   http://ceur-ws.org/Vol-2104/paper_244.pdf
10. Google Course builder https://opensource.google/projects/course-builder

LE5013 ARTIFICIAL INTELLIGENCE

OBJECTIVES
● To know the underlying structure behind intelligence mathematically.
● To know the logical implications in computational intelligence.
● To know the automated learning techniques.
● To study the techniques of Knowledge Representation.
● To explore Artificial Intelligence techniques in real–time scenarios.

UNIT - I INTELLIGENT AGENTS AND KNOWLEDGE REPRESENTATION


Suggested Activities:
● Flipped classroom on intelligent agents, means of knowledge representation
● Assignment on exercise questions on PEAS formulation from the text-book.
● Examples of knowledge representation through different methods and reasoning.
● Practical – Ontology creation using Protégé.

Suggested Evaluation Methods:
● Tutorial on intelligent agents and PEAS formulation.
● Assignments on semantic nets, frames.
● Quizzes on agents.

UNIT - II SEARCH TECHNIQUES


Suggested Activities:
● Flipped classroom on uninformed search and searching with costs.
● In-class activity – Solve puzzles with uninformed and informed searches.
● Practical – Implementation of search through Python/ Other languages.

Suggested Evaluation Methods:
● Tutorial – Different types of searches.
● Assignments on uninformed and informed searches.
● Quizzes on heuristic methods.
● Practical – Programming exercises on different search strategies.
UNIT - III  REASONING WITH LOWER ORDER LOGICS


Suggested Activities:

- Reasoning methods through puzzles and real life scenarios.
- Implementation: Inference through prolog/python.

Suggested Evaluation Methods:

- Tutorial – Inference methods.
- Assignments on theorem proving and resolution.
- Quizzes on basics of logic – syntax and semantics.
- Practical – Programming exercises for theorem proving.

UNIT - IV  ARTIFICIAL INTELLIGENCE PLANNING


Suggested Activities:

- Flipped classroom on planning methods.
- Assignments on derivation of plan through partial order plan, graph plan and hierarchical plan.

Suggested Evaluation Methods:

- Tutorial – Different planning methods.
- Assignments on graph plan, SAT plan.
- Quizzes on planning in non-deterministic domains.
- Practical – Programming exercises on planning with PDDL/PDL/Python.

UNIT - V  LEARNING TECHNIQUES

Logical Formulation of Learning – Knowledge in Learning – Explanation-Based Learning – Learning using Relevance Information – Inductive Logic Programming – Statistical Learning

Learning with Complete Data – Learning with Hidden Data – Applications.

Suggested Activities:

- Flipped classroom on theoretical study of learning methods
- Assignment on solving problem in statistical learning
- Practical – Programming exercises using Python/ other programming languages.

Suggested Evaluation Methods:

- Tutorial – Learning methods.
- Assignments on statistical methods in learning.
- Quizzes on learning methods.

Practical – Programming exercises on Statistical learning

TOTAL: 45 PERIODS

OUTCOMES:

- Apply the search techniques to real–time problems.
- Apply the reasoning techniques to real world problems.
- Demonstrate the understanding of representation of knowledge.
• Demonstrate the understanding of learning techniques.
• Apply AI techniques in developing real world applications.

REFERENCES
4. NPTEL Artificial Intelligence Course by Prof. Dasgupta – http://nptel.ac.in/courses/106105079/2

LE5014 MULTIMEDIA SECURITY TECHNIQUES

OBJECTIVES
• To understand the cryptanalysis on standard algorithms meant for confidentiality, integrity and authenticity.
• To know about the Digital rights management.
• To know about the concepts of Digital Watermarking techniques.
• To understand the concept of Steganography
• To learn the privacy preserving techniques on Multimedia data.

UNIT I CRYPTANALYSIS AND DIGITAL RIGHTS MANAGEMENT


Suggested Activities:
• External learning - cryptanalysis for algorithms such as AES, RSA.
• Analysis for DRM products.

Suggested Evaluation Methods:
• Group discussion on linear and differential cryptanalysis of cryptographic algorithms.
• Tutorial on DRM products.

UNIT II DIGITAL WATERMARKING BASICS


Suggested Activities:
• Problems on Error Correction Coding.
• Designing a good watermark.

Suggested Evaluation Methods:
• Assignment on ECC.
• Tutorial on DRM products.
UNIT III  DIGITAL WATERMARKING SCHEMES AND PROTOCOLS


Suggested Activities:
- Implementation of buyer seller watermarking protocol.
- Analyzing the performance of different media specific WM and WM for CG models.

Suggested Evaluation Methods:
- Tutorial - Media specific watermarking techniques.
- Group discussion on the performance evaluation of watermarking techniques.

UNIT IV  STEGANOGRAPHY AND STEG ANALYSIS


Suggested Activities:
- An application development using Steganography.

Suggested Evaluation Methods:
- Project.

UNIT V  MULTIMEDIA ENCRYPTION


Suggested Activities:
- Case study on forensic data.

Suggested Evaluation Methods:
- Case study on forgery detection.

Outcomes
- Analyze the security algorithms required by any computing system.
- Identify the security challenges and issues that may arise in any system.
- Implement the concepts of steganography, digital watermarking techniques, etc.
- Design secure applications using steganography and water marking schemes
- Apply concepts on digital rights management while developing secure systems
- Design any secure system by preserving the privacy.

TOTAL: 45 PERIODS

References


LE5015 SOCIAL MEDIA WEB ANALYTICS

OBJECTIVES
To showcase the opportunities that exist today to leverage the power of the web and social media

UNIT - I INTRODUCTION
Evolution of online communities - History and Evolution of Social Media- Social Media vs. traditional media - Social Media Audience and Goals for using Social Media - Understanding Social Media: Strong and weak ties – Influencers - How ideas travel – Viralness - Social theory and social media - technological determinism in popular discourse on social media technologies.

UNIT - II COMMUNITY BUILDING AND MANAGEMENT
Science of Social Media - Keys to Community Building - Promoting Social Media Pages- Linking Social Media Accounts-The Viral Impact of Social Media-Digital PR-Encourage Positive Chatter in Social Media - Identity in social media: formation of identities, communities, activist movements, and consumer markets - Social Media as business.

UNIT - III SOCIAL MEDIA POLICIES AND MEASUREMENTS
Social Media Policies-Etiquette, Privacy- ethical problems posed by emerging social media technologies - The road ahead in social media - The Basics of Tracking Social Media - social media analytics- Insights Gained From Social Media- Customized Campaign Performance Reports - Observations of social media use.

UNIT - VI WEB ANALYTICS

UNIT - V SEARCH ANALYTICS
Search engine optimization (SEO), non-linear media consumption, user engagement, user generated content, web traffic analysis, navigation, usability, eye tracking, online security, online ethics, content management system, data visualization, RSS feeds, Mobile platforms, User centered design, Understanding search behaviors.

TOTAL: 45 PERIODS

OUTCOMES
● Evaluate social media messaging and data.
● Apply aspects of social media monitoring to business decisions.
● Evaluate and judge social media contributions.
● Examine multiple social media metrics to monitor and identify deviations from typical social media activity.
Use the resulting insights to support website design decisions, campaign optimization, search analytics.

REFERENCES
2. Christian Fuchs, Social Media a critical introduction, SAGE Publications Ltd, 2014
5. T. Peterson, Web Analytics Demystified, Celilo Group Media and Café Press, 2004

LE5016 EDUCATIONAL MANAGEMENT INFORMATION SYSTEM

OBJECTIVES
- To explain about the Concept of educational information system
- To analyze the different data of educational information system
- To discuss the activities of educational transformation
- To explain the research issues educational management
- To discuss about the different educational application management

UNIT - I INFORMATION SYSTEM

UNIT - II DATABASE SYSTEMS AND BIG DATA
Data fundamentals - Data Modelling and Database Characteristics – Student data- Teacher data – Institutional data - Relational Database Management Systems - Big Data - Characteristics of Big Data - Sources of Big Data - Big Data Uses - Challenges of Big Data - Data Management - Technologies Used to Process Big Data - Data Warehouses, Data Marts, and Data Lakes - NoSQL Databases – Hadoop - In-Memory Databases

UNIT - III INSTITUTIONAL TRANSFORMATION
Introduction to Institutional Transformation and Educational Management – Theories of Leadership – styles and measurement of leadership - ERP for institutional transformation - Gender and Education management – e-school effectiveness and improvement

UNIT - IV RESEARCH IN EDUCATIONAL MANAGEMENT
Aspect of educational management, planning, organizing and controlling human resources management, conflict management and time management Educational Administration, Leadership and Management

UNIT - V EDUCATIONAL APPLICATIONS AND MANAGEMENT
Application of Educational Management in Academic Areas - Application of Educational Management in Administrative Areas - Quality Management in Education: Challenges - Total Quality Management -
OUTCOMES
- To compare different information system with respect to operating environment
- To use different kind of data collected from the educational environment and process it
- To plan for the institutional transformation to achieve the vision of the institute
- To work on the collaborative research projects in the institutional level
- To design educational applications to use at the institutional level

REFERENCES
1. E-book on EDUCATIONAL MANAGEMENT, USI PUBLICATIONS, 2012

LE5017 HUMAN COMPUTER INTERACTION TECHNIQUES

OBJECTIVES
- To learn the principles and fundamentals of HCI.
- To understand components of interfaces and screens, including windows, menus and controls.
- 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 understand the rationale and guidelines for an effective interface design methodology.

UNIT - I DESIGN PROCESS

Suggested Activities:
- Flipped classroom on knowledge on the HCI design process.
- External learning – Exploration of various human computer interfaces.

Suggested Evaluation Methods:
- Tutorials – HCI design process.
- Assignment on comparison of various interfaces.

UNIT - II DESIGN AND EVALUATION OF INTERACTIVE SYSTEMS

**Suggested Activities:**
- Flipped classroom on designing a good User Interface system based on design rules.
- External learning – Techniques related to evaluation of HCI design.

**Suggested Evaluation Methods:**
- Tutorial – Usage of design rules to create interfaces.
- Assignment on applying evaluation techniques on different user interfaces.

**UNIT - III COMMUNICATION MODELS**


**Suggested Activities:**
- Flipped classroom on basic knowledge of various models used in HCI design.
- External learning – Design and implementation of various models used in HCI design.

**Suggested Evaluation Methods:**
- Tutorial – Task models.
- Assignment on dialog models and task models.

**UNIT - IV EXPERIMENTAL DESIGN AND STATISTICAL ANALYSIS OF HCI**


**Suggested Activities:**
- Flipped classroom on basic concepts of probability and statistics.
- External learning – Practical problems related to hypothesis testing.

**Suggested Evaluation Methods:**
- Tutorial – Statistical testing related to UI evaluation parameters.
- Assignment on problems on hypothesis testing for UI parameters.

**UNIT - V DIALOGUE AND CURRENT TRENDS**


Suggested Activities:
- Flipped classroom on basic concepts of dialogue notations and design.
- External learning – Study of how Virtual Reality interface are used in various real time applications.

Suggested Evaluation Methods:
- Tutorial – Recent trends in human computer interface systems.
- Assignment on dialogue notation representation for various interfaces.

TOTAL: 45 PERIODS

OUTCOMES
1. Interpret the contributions of human factors and technical constraints on human- computer interaction.
2. Evaluate the role of current HCI theories in the design of software.
3. Design and develop interfaces related to real applications.
4. Apply exploratory and experimental research methods in HCI.
5. Familiarize with principles and guidelines of user centered interface design process, evaluation methodologies and tools to analyze the interfaces.
6. Implement human computer interfaces for different applications using various tools and technologies.

REFERENCES
● External learning - Problems related to acquiring data.

**Suggested Evaluation Methods:**
● Tutorial - Different data visualizing images.
● Assignment on different data acquiring methods.
● Quizzes on issues and solutions in different visualization applications.

**UNIT - II DATA REPRESENTATION**


**Suggested Activities:**
● Blended learning - Human Visual and Auditory System.
● Flipped classroom on color formats.
● External learning - Survey on different human computer interaction and types of user interface.

**Suggested Evaluation Methods:**
● Assignment on human visual and auditory system.
● Quizzes on various color format.
● Assignment on human computer interaction user interface.

**Unit - III DATA PRESENTATION**


**Suggested Activities:**
● Blended learning - Drawing Charts for display.
● Flipped classroom on various presentation techniques.
● External learning - Different font and font styles, symbols and Gesture representation.

**Suggested Evaluation Methods:**
● Assignment on chart preparation.
● Tutorial - Various presentation techniques.
● Assignment on gesture presentation.

**UNIT - IV INTERACTION AND DESIGN**


**Suggested Activities:**
● Flipped classroom on various interacting Techniques.
● External learning - Interaction facilities and high level support for animation design.
Suggested Evaluation Methods:
- Tutorial - Interaction models.
- Assignment on animation design.

UNIT - V  CURRENT TRENDS


Suggested Activities:
- Flipped classroom on implementation of virtual reality environment.
- Mini project for designing and implementing a innovative interfaces.

Suggested Evaluation Methods:
- Demonstration of the mini project.
- Tutorial - Virtual reality application.

TOTAL: 45 PERIODS

OUTCOMES
- Apply mathematics and basic science knowledge for designing information visualizing System.
- Collect data ethically and solve engineering problem in visualizing the information.
- Implement algorithms and techniques for interactive information visualization.
- Conduct experiments by applying various modern visualization tool and solve the space layout problem.
- Analyze and design system to visualize multidisciplinary multivariate Data individually or in teams.
- Develop a cost effective and a scale able information visualization system.

REFERENCES

LE5019  SOUND DESIGN TECHNIQUES  L T P C
3 0 0 3

OBJECTIVES
- To make students aware of the basic principles of sound.
- To learn about sound production and hearing.
- To learn about designing sound techniques.
- To know about Studio environment.
To know about Surround Sound.

UNIT - I  PRINCIPLES OF SOUND


Suggested Activities:
- Flipped classroom on human speech production and voice box of human.
- External learning - Physical & psychological properties of sound, microphones and its types.
- Assignment on numerical problems in computing sound parameters.

Suggested Evaluation Methods:
- Tutorial - Sound characteristics.
- Assignments on computation of phase, amplitude and loudness of sound.
- Quizzes on sound properties.

UNIT - II  LISTENING SOUND


Suggested Activities:
- Flipped classroom on human auditory mechanisms, stereo sound.
- External learning - Binaural and stereo recording techniques, sound effects.
- Assignment on numerical problems in stereo signals.

Suggested Evaluation Methods:
- Tutorial - Sound acoustics.
- Assignments on mono and stereo sound.
- Quizzes on human auditory mechanisms.

UNIT - III  DESIGNING SOUND


Suggested Activities:
- Flipped classroom on perception of sound.
- External learning - MIDI formats, music synthesis.
- Assignment on numerical problems in music signals processing.

Suggested Evaluation Methods:
- Tutorial - Audio perception.
- Assignments on sound design.
- Quizzes on music processing.

UNIT - IV  STUDIO MANAGEMENT

Suggested Activities:
- Flipped classroom on sound mixing
- External learning - Studio instruments, studio layout and design

Suggested Evaluation Methods:
- Quizzes on studio equipment.
- Quizzes on studio management.

UNIT - V  SURROUND SOUND  9

Principles of Loudspeaker – Types of Loudspeakers – Stereo, Two–Channel Signal Formats and Microphone techniques, Binaural Recording and Dummy Head Techniques, Surround Sound – Three Channel Stereo, Four Channel Surround, 5.1 Channel Surround, and Other Multichannel Configurations. Surround Sound Systems, Matrix Surround Sound Systems, Dolby Digital, DTS, and Ambisonics.

Suggested Activities:
- Flipped classroom on loudspeakers and its types.
- External learning - Survey of cinematic sound systems, layout and design of home theater.

Suggested Evaluation Methods
- Quizzes on types of loudspeakers and microphones.
- Quizzes on surround sound.

TOTAL: 45 PERIODS

OUTCOMES
- Have knowledge about basics of sound.
- Know about the auditory mechanisms.
- Know about studio management.
- Compose a music using tools.
- Know about studio equipment and design.
- Know about surround sound.

REFERENCES
UNIT - I VIDEO FUNDAMENTALS


Suggested Activities
● In class activity – Numerical problems related to sampling and standards conversion.
● Flipped classroom – Discussion on video features.

Suggested Evaluation Methods
● Online quiz on video features.
● Assignments on sampling and standards conversion.

UNIT - II MOTION ESTIMATION AND VIDEO SEGMENTATION

Fundamentals of Motion Estimation – Optical Flow – 2D and 3D Motion Estimation – Block Based Point Correspondences – Gradient Based Intensity Matching – Feature Matching – Frequency Domain Motion Estimation – Video Segmentation.

Suggested Activities
● In-class activity – Numerical problems related to motion estimation.
● External learning – Survey on optical flow techniques.

Suggested Evaluation Methods
● Online quiz on optical flow techniques.
● Assignments on numerical problems in motion estimation.

UNIT - III FUNDAMENTAL DATA ANALYSIS


Suggested Activities
● In class activity – Graphical presentation of data for visualization.
● External learning – Survey on Modern Data Analytic Tools.

Suggested Evaluation Methods
● Quiz on modern data analytic tools.
● Assignments on data visualization.

UNIT - IV MINING DATA STREAMS AND VIDEO ANALYTICS


Suggested Activities
● Flipped classroom on discussion on automatic video trailer generation.
● External learning – Survey on analytic processes and tools.

Suggested Evaluation Methods
● Quiz on video trailer generation.
● Assignments on analytic processes and tools.
UNIT - V  EMERGING TRENDS

Affective Video Content Analysis – Parsing a Video into Semantic Segments – Video Indexing and Abstraction for Retrievals – Automatic Video Trailer Generation – Video In painting – Forensic Video Analysis.

Suggested Activities
● External learning – Survey on Affective Video Content Analysis.
● Flipped classroom on discussion on forensic video analysis.

Suggested Evaluation Methods
● Online quiz on forensic video analysis.
● Assignments on affective video content analysis.
● Compare the video features extracted from a given video dataset using graphical representation.

TOTAL: 45 PERIODS

OUTCOMES
● Discuss video processing fundamentals
● Analyze video features for segmentation purpose
● Derive numeric problems related to motion estimation
● Process video streams for analytics purpose
● Parse and index video segments
● Design applications for video analytics in current trend

REFERENCES