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Total Number of credits to be earned for M.TECH degree: 71

CONTACT HOUR/CREDIT:
L: Lecture Hours per week  
T: Tutorial Hours per week  
P: Practical Hours per week  
C: Credit

NOTE:

Students have to register for the courses as per the following guidelines:

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<th>II Semester</th>
<th>III Semester</th>
<th>IV Semester</th>
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SEMMESTER I & II

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<th>T</th>
<th>P</th>
<th>C</th>
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</table>

Total Contact Hours - 75

Prerequisite: NIL

PURPOSE
Data structures play a central role in modern computer science. You interact with data structures much more often than with algorithms (think of Google, your mail server, and even your network routers). In addition, data structures are essential building blocks in obtaining efficient algorithms. This course will cover major results and current directions of research in data structures.

INSTRUCTIONAL OBJECTIVES
1. To make the student learn an object-oriented way of solving problems.
2. To make the student write ADTS for all data structures.
3. To make the student learn different algorithm design techniques.

UNIT 1 - OVERVIEW OF C++ (5 hours)
C++ class overview-class definition-objects-class members- access control-constructors and destructors-parameter passing methods-dynamic memory allocation and de-allocation-Function overloading.

UNIT II - LINEAR DATA STRUCTURES AND ALGORITHM ANALYSIS (7 hours)

UNIT III - NON LINEAR DATA STRUCTURES AND HASH TABLES (14 hours)
UNIT IV - DIVIDE AND CONQUER & GREEDY METHOD  (9 hours)

UNIT V - DYNAMIC PROGRAMMING AND BACKTRACKING  (10 hours)
General Method- 0 / 1 Knapsack problem- Reliability Design- Traveling Sales Person’s Problem. General Method-8–Queen’s Problem-Graph Coloring-Branch and Bound

Practical  (30 hours)

REFERENCES


<table>
<thead>
<tr>
<th>IT2002</th>
<th>OBJECT ORIENTED SOFTWARE ENGINEERING</th>
<th>L</th>
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Prerequisite:
Object Oriented Analysis and Design, Programming in Java

PURPOSE
As Software development is the expensive process, proper measures are
required so that the resources can be used efficiently and effectively. Thus this course is to provide the students with the concepts of organized methodology for implementing medium-large software systems like Team programming, Common design and coding methodologies, including Object-Oriented Design (OOD), Design Patterns, Refactoring, and the Unified Modeling Language (UML) and Standard software engineering tools.

### INSTRUCTIONAL OBJECTIVES

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Understand the phases in a software project and activities in project management</td>
</tr>
<tr>
<td>2</td>
<td>Comprehend the purpose of different UML diagrams</td>
</tr>
<tr>
<td>3</td>
<td>Understand the major considerations in collecting, documenting and analyzing project requirements.</td>
</tr>
<tr>
<td>4</td>
<td>Cognize the activities in the crucial phase of system design.</td>
</tr>
<tr>
<td>5</td>
<td>Identify the key phases in the recent trends of RUP and agile development</td>
</tr>
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</table>

### UNIT I - INTRODUCTION TO SOFTWARE ENGINEERING (3 hours)
Software engineering development activities-Managing software development

### UNIT II - MODELING WITH UML  (9 hours)

### UNIT III - REQUIREMENTS AND ANALYSIS (9 hours)
Requirements Elicitation - Concepts - Activities & Managing Requirements Elicitation
Analysis: Concepts - Analysis Activities - Analysis Model

### UNIT IV - SYSTEM DESIGN (15 hours)
Decomposing the System - Addressing Design Goals - Reusing Patterns - Specifying Interfaces - Mapping Models to Code.

### UNIT V-AGILE DEVELOPMENT AND RATIONAL UNIFIED PROCESS (9 hours)
Rational Unified Process Key Features - Software Best Practices - Static Structure - Dynamic Structure
Agile Development: Adapting to Scrum - Patterns for Adopting to Scrum - New Roles - Changed Roles - Sprints - Product Backlogs - Teamwork
Practical (30 hours)
REFERENCES


<table>
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</table>

Prerequisite:
NIL

PURPOSE
The purpose of this course is to introduce the basic concepts and applications of computer graphics and to equip the students with hand-on experience in 2D/3D computer graphics programming using a high-level graphics language specification such as OpenGL.

INSTRUCTIONAL OBJECTIVES
1. Explain two and three dimensional concepts and their applications
2. Identify all techniques related to modern graphics programming concepts
3. To understand 2D and 3D graphics and their transformations
4. To understand various clipping techniques
5. To understand various illumination and color models

UNIT I – INTRODUCTION (9 hours)
Software; Output primitives – points and lines, line drawing algorithms, loading the frame buffer, line function; circle and ellipse generating algorithms; Pixel addressing and object geometry, filled area primitives.

UNIT II – TWO DIMENSIONAL GRAPHICS (9 hours)
Two dimensional geometric transformations – Matrix representations and homogeneous coordinates, composite transformations; Two dimensional viewing – viewing pipeline, viewing coordinate reference frame; widow-to-viewport coordinate transformation, Two dimensional viewing functions; clipping operations – point, line, and polygon clipping algorithms.

UNIT III – THREE DIMENSIONAL GRAPHICS (9 hours)
Three dimensional concepts; Three dimensional object representations – Polygon surfaces- Polygon tables- Plane equations - Polygon meshes; Curved Lines and surfaces, Quadratic surfaces; Blobby objects; Spline representations - Bezier curves and surfaces - B-Spline curves and surfaces.

UNIT IV – THREE DIMENSIONAL TRANSFORMATION AND VIEWING (9 hours)
Three dimensional geometric and modeling transformations – Translation, Rotation, Scaling, composite transformations; Three dimensional viewing – viewing pipeline, viewing coordinates, Projections, Clipping; Visible surface detection methods.

UNIT V – ILLUMINATION AND COLOUR MODELS (9 hours)
Light sources - basic illumination models – halftone patterns and dithering techniques; Properties of light - Standard primaries and chromaticity diagram; Intuitive color concepts - RGB color model - YIQ color model - CMY color model - HSV color model - HLS color model; Color selection.

Practical: (30 hours)

REFERENCES

### PURPOSE
To provide sound knowledge in scripting languages, user interface design, and efficient program development to create exciting, compelling interactive user experiences.

### INSTRUCTIONAL OBJECTIVES
1. Understand the basics of event based programming using Adobe Flash together with XML capabilities to render rich content in the browser.
2. Comprehend the standards of Flex by which applications can be deployed consistently on all major browsers, desktops, and devices with necessary skills to design rich forms that apply the use of data binding and validation.
3. Gain knowledge on both client and server side scripting with Javascript and PHP.
4. To understand the Adobe Integrated Runtime (AIR) for building Rich Internet applications (RIA).

### UNIT I-INTRODUCTION TO ACTION SCRIPT IN FLASH  (9 hours)
Programming Concepts – Variables, Data types, conditionals, loops, arrays, Functions, Custom objects - Properties, Methods and Events – Display List, Timeline Control.

### UNIT II-ADVANCE CONCEPTS IN ACTION SCRIPT USING FLASH BUILDER  (9 hours)
OOP –Motion –Drawing with Vectors and Pixels –Text –Sound and video – Understanding XML

### UNIT III-ACTION SCRIPT IN FLEX  (9 hours)
Setting up the environment –Using Design mode and Source mode –Adding Interactivity –Using Data Binding –Layout –Creating Rich Forms

### UNIT IV-JAVASCRIPT & PHP  (9 hours)
**JavaScript** –Introduction –Variables and Data types –Control Structures – JavaScript Objects.  **PHP** –PHP language Basics –Files and directories –Data Retrieval using PHP
UNIT V-ADOBE AIR  (9 hours)

Practical:  (30 hours)

REFERENCES

2. Chafic Kazoun and Joey Lott, “Programming Flex 3”, Adobe Developer Library.

<table>
<thead>
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<th>MM2003</th>
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<td>Basic knowledge about 2D, 3D Analytical Geometry, C and C++ programming languages</td>
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PURPOSE
The main purpose of this course is to provide the student with sound programming skills to learn Game design. Integrate technologies such as artificial intelligence to develop interactive game application.

INSTRUCTIONAL OBJECTIVES

1. To Understand principles of Game design and Game Engine design
2. Good knowledge of implementing games in various platform
3. Making use of artificial intelligence in gaming
4. Understand different types of animation
UNIT I - Fundamental of Game Programming (9 hours)
Fundamental of Game Programming: Input, Applying Game Logic, Game Loops, Game Timings, Core Architecture Using State Controls, ACTOR Management, Collision Detection, Artificial Intelligence, 2D Graphics Programming: Rendering, Render Loop, Handling Window Events

UNIT II - Game Network and Game Database (9 hours)

UNIT III - 3D Game (9 hours)

UNIT IV - Game Agents (9 hours)

UNIT V - Game Development (9 hours)

Practical: (30 hours)

REFERENCES


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**PURPOSE**
The purpose of this course is to study the fundamental concepts in web technology and to study the various server side and client side scripting languages.

**INSTRUCTIONAL OBJECTIVES**
1. To get proficient in Web Essentials and Web Development using HTML and CSS
2. To gain knowledge in Java Script and its library jQuery
3. To understand Server Side Scripting like Servlets and JSP
4. Ability to plan and implement XML based Applications
5. To build web application with extensive client-side interactivity

**UNIT I – Web Essentials, HTML5, CSS3** (9 hours)
**HTML5**: Basic Tags-Canvas, SVG, Drag/Drop, Geolocation, Video, Audio, Input types-Form elements, form Attributes.
**CSS3**: Borders-Backgrounds-TextEffects-Fonts-2D and 3D Transforms-Transitions-Animations

**UNIT II – JAVASCRIPT and JQUERY** (9 hours)
**JavaScript**: An Introduction to JavaScript -Objects in JavaScript: Data and Objects - Built-in objects - Events - DHTML with JavaScript. 
**jQuery**: 
Selectors, Events-jQuery Effects: Hide/Show, Fade ,Animate, stop, callback, chaining-jQuery DOM manipulation

UNIT III – SERVLETS AND JSP (9 hours)

UNIT IV– XML (9 hours)

UNIT V– AJAX (9 hours)
AJAX-xmlHttpRequest object-AJAX applications-AJAX frame work .Web design Frameworks: Responsive web design-Overview on Twitter bootstrap, DoJo, YahooUI, Google web toolkit libraries. Applets-Overview on javaFX applets.

Practical: (30 hours)

REFERENCES
6. www.w3schools.com
PURPOSE

Seminar is one of the important components for the engineering graduates to exhibit and expose their knowledge in their field of interest. It also gives a platform for the students to innovate and express their ideas in front of future engineering graduates and professionals.

INSTRUCTIONAL OBJECTIVES

1. To make a student study and present a seminar on a topic of current relevance in Information Technology or related fields.
2. Enhancing the debating capability of the student while presenting a seminar on a technical topic.
3. Training a student to face the audience and freely express and present his ideas without any fear and nervousness, thus creating self-confidence and courage which are essentially needed for an Engineer.

GUIDELINES

1. Each student is expected to give a seminar on a topic of current relevance in IT/Related field within a semester.
2. Students have to refer published papers from standard journals.
3. The seminar report must not be the reproduction of the original papers but it can be used as reference.

ASSESSMENT

1. Assessment will be done according to university regulation.

PURPOSE

To undertake research in an area related to the program of study

INSTRUCTIONAL OBJECTIVE

The student shall be capable of identifying a problem related to the program of study and carry out wholesome research on it leading to findings which will facilitate development of a new/improved product, process for the benefit of the society.
M.Tech projects should be socially relevant and research oriented ones. Each student is expected to do an individual project. The project work is carried out in two phases – Phase I in III semester and Phase II in IV semester. Phase II of the project work shall be in continuation of Phase I only. At the completion of a project the student will submit a project report, which will be evaluated (end semester assessment) by duly appointed examiner(s). This evaluation will be based on the project report and a viva voce examination on the project. The method of assessment for both Phase I and Phase II is shown in the following table:

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Student will be allowed to appear in the final viva voce examination only if he / she has submitted his / her project work in the form of paper for presentation / publication in a conference / journal and produced the proof of acknowledgement of receipt of paper from the organizers / publishers.
SUPPORTIVE COURSE

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<th>MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE</th>
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PURPOSE
To impart analytical ability and to solve real life problems pertaining to branches of Computer Science and Engineering.

INSTRUCTIONAL OBJECTIVES
1. To be exposed with logic
2. To be thorough in mathematical induction
3. To understand algebraic systems such as relations
4. To be familiar with the basic concepts of lattices

UNIT I – LOGIC (9 hours)
Logic - Statements - Connectives - Truth tables - Normal forms - Predicate calculus - Inference Theory for Statement calculus and predicate calculus.

UNIT II – COMBINATORICS (9 hours)
Combinatory - Mathematical Induction - Pigeonhole principle - Principle of inclusion and exclusion.

UNIT III – RECURSIVE FUNCTIONS (9 hours)
Recursive Functions- Recurrence relation - Solution of recurrence relation using characteristic polynomial and using generating function - Recursive functions - Primitive recursive functions, Computable and non computable functions.

UNIT IV – ALGEBRAIC STRUCTURES (9 hours)
Algebraic Structures - Groups - Definition and examples only - Cyclic groups Permutation group (Sn and Dn) - Subgroups - Homomorphism and Isomorphism - Cosets - Lagrange's Theorem - Normal subgroups - Cayley's representation theorem.

UNIT V – LATTICES (9 hours)
Lattices - Partial order relations, Poset - Lattices, Hasse diagram - Boolean algebra.
REFERENCES
PROGRAM ELECTIVES

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Total Contact Hours - 45

Prerequisite: NIL

PURPOSE
The purpose of this course is to understand the various concepts of compression methods, hardware and software used in multimedia and to get familiar with the various file formats used in multimedia.

INSTRUCTIONAL OBJECTIVES
1. To understand Multimedia hardware and software
2. To understand Multimedia system architecture
3. To understand various compression techniques
4. To understand various file formats
5. To understand storage media

UNIT I – Multimedia System Design: An Introduction (9 hours)

UNIT II – Compression and Decompression Techniques (9 hours)
Types of Compression, Binary Image Compression Schemes, Color, gray scale, still-video image compression, Discrete Cosine Transform, Video Image compression, MPEG Coding methodology, Audio Compression, Data and File format standards- RTF, TIFF, RIFF, MIDI, JPEG, AVI, JPEG, TWAIN Architecture.

UNIT III – MULTIMEDIA INPUT AND OUTPUT TECHNOLOGIES (9 hours)
Key Technology Issues, Pen Input, Video and Image Display Systems, Print Output Technologies, Image Scanners, Digital Voice and Audio, Video Images and Animation, Full Motion Video.
UNIT IV– STORAGE AND RETRIEVAL TECHNOLOGIES  (9 hours)
Magnetic Media Technology, RAID-Level-0 To 5, Optical Media, WORM optical drives, Hierarchical Storage Management, Cache Management for storage systems.

UNIT V– MULTIMEDIA APPLICATION DESIGN  (9 hours)
Types of Multimedia systems - Virtual Reality Design - Components of Multimedia system - Distributed Application Design Issues - Multimedia Authoring and User Interface - Hypermedia Messaging - Distributed Multimedia Systems

REFERENCES

<table>
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<tr>
<th>MM2102</th>
<th>COMPUTER MODELING AND ANIMATION</th>
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PURPOSE
This Course enables the students to explore principles of 3-dimensioning and apply them in the creation of 3D computer representations using appropriate modeling software. Emphasis will be placed on creation of accurate models rendered with color, shading, texture mapping and lighting to simulate effects of materials, finishes and surface graphics.

INSTRUCTIONAL OBJECTIVES
1. To involve the students to use/manipulate the software interface
2. To gain knowledge in creation of objects
3. To use various modifiers and particle systems
4. To apply appropriate materials to objects
5. To use lights, cameras and rendering with environments
UNIT I –INTRODUCTION TO 3D ELEMENTS AND CREATION  
(6 hours)
Understanding coordinate system, vertex, faces and object - Concept of wireframe, surface and solid modeling- Creating primitive objects and patches- Understanding modification methods and transformation of 3D objects - Creating primitives using keyboard and dimensional control.

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

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

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

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

Practical:  
(30 hours)

REFERENCES


MM2103 | L | T | P | C
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VIRTUAL REALITY | 3 | 0 | 0 | 3
Total contact hours - 45
Prerequisite:
NIL

PURPOSE
In this course the techniques and technologies that need to be brought together to allow people to work efficiently in virtual worlds is explored with the principles of virtual reality and virtual environments, hardware, software and design issues in presenting images and sound in immersive environments, input and control devices, quantitative assessment of virtual reality systems

INSTRUCTIONAL OBJECTIVES
1. Understand key elements of virtual Reality with the components in VR systems and various input and output devices required for interacting in virtual world along with rendering and modeling.
2. Understand the human factors needed in navigating in Virtual world
3. Gain knowledge in Virtual reality modeling language

UNIT I - INTRODUCTION TO VIRTUAL REALITY (9 hours)
Virtual Reality-Key Elements-Components of VR system-Interface to Virtual World –Input and output

UNIT II - RENDERING THE VIRTUAL WORLD (9 hours)
Representation of virtual world- Rendering systems- Modeling

UNIT III - INTERACTING WITH VIRTUAL WORLD (9 hours)
Human factors in VR- Manipulating –Navigating- interacting in virtual world- virtual reality experience – Applications

UNIT IV - VRML INTRODUCTION AND CONCEPTS (9 hours)

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

REFERENCES


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PURPOSE
To introduce the dynamic field of human-computer interaction (HCI) and Students learn practical principles and guidelines needed to develop high quality interface designs—ones that users can understand, predict, and control. It covers theoretical foundations, and design processes such as expert reviews and usability testing.

INSTRUCTIONAL OBJECTIVES
1. Provides a broad survey of designing, implementing, managing, maintaining, training, and refining the user interface of interactive systems
2. Describes practical techniques and research-supported design guidelines for effective interface designs
3. Delivers informative introductions to development methodologies, evaluation techniques, and user-interface building tools.
4. Guides students who might be starting their first HCI design project

UNIT I-INTRODUCTION

(6 hours)
Introduction - GUI advantages – Usability Goals and Measures – Usability Motivation – Guidelines - Principles – Comparison of GUI and web design

UNIT II-DEVELOPMENT PROCESS (6 hours)

UNIT III-INTERACTION STYLES (6 hours)
Examples of direct Manipulation - 3D Interface- Virtual and Augmented Reality Task related Menu Organization - Single Menu, Combination of Multiple Menu - Content Organization, Data Entry with Menus - Command & Natural Language - Command organization functionality, Strategies

UNIT IV-DESIGN ISSUES (6 hours)
Quality of Services - Models of Response – Time Impacts - Expectation and Attitude - User Productivity and Variability in Response Time - Online versus Paper Documentation - Shaping the content and Accessing the Document - Online Tutorial - Development Process and Examples

UNIT V-INFORMATION SEARCH AND VISUALIZATION (6 hours)
Information Search and Visualization - Searching in Textual documents and Database Querying Multimedia Document Searches - Advanced filtering - Data type by Task Taxonomy - Challenges for Information Visualization - Practicing Examples

Practical: (30 hours)

REFERENCES

 PURPOSE

This course intends to give an in–depth knowledge in Multimedia security and to gain knowledge and hands-on experience about multimedia systems and security technologies, theories, research issues and recent developments of multimedia-based security systems, such as video surveillance, biometric feature applications, and sensor networks.

INSTRUCTIONAL OBJECTIVES

1. To understand the multimedia security needs
2. To evaluate the multimedia security weakness through forensics
3. Enable the students to develop secured multimedia application

UNIT I – Multimedia System Overview (9 hours)

UNIT II – Secured Multimedia (9 hours)

UNIT III – Multimedia Authentication (9 hours)
Pattern, Speaker and Behavior Recognition - Speaker Recognition - Face Recognition

UNIT IV– Multimedia Forensics (9 hours)
Digital Forensics taxonomy, goals/requirements - Forensic Data Acquisition - Digital Forensics Tools -Forensics Analysis and Validation - File and Network Forensics – Techniques - Application forensics- Email, Graphics and Multimedia Forensics

UNIT V– Multimedia Security Applications (9 hours)
Media Sensor Network - Voice over IP (VoIP) Security – DTH – Video Conference
REFERENCES


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PURPOSE
The main purpose of this course is to provide the student about the database storage, retrieval of Multimedia elements.

INSTRUCTIONAL OBJECTIVES
1. To understand basic of database
2. To understand different types data structure
3. To understand Design and Architecture of a Multimedia Database
4. To understand Audio and Video Storage

UNIT I-INTRODUCTION TO DATABASE (9 hours)

UNIT II-MULTIDIMENSIONAL DATA STRUCTURES (9 hours)
k-d Trees - Point Quadtrees - The MX-Quadtree - R-Trees - comparison of Different Data Structures.

UNIT III-IMAGE RETRIEVAL MECHANISMS (9 hours)
UNIT IV-AUDIO/VIDEO DATABASES (9 hours)
Audio Databases - A General Model of Audio Data - Capturing Audio Content through Discrete Transformation - Indexing Audio Data. Video Databases - Organizing Content of a Single Video - Querying Content of Video Libraries - Video Segmentation

UNIT V-MULTIMEDIA DATABASE DESIGN (9 hours)
Design and Architecture of a Multimedia Database - Organizing Multimedia Data Based on The Principle of Uniformity - Media Abstractions - Query Languages for Retrieving Multimedia Data.

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Prerequisite: NIL

PURPOSE
The purpose of this course is to introduce the concepts and applications of Digital Image Processing and to equip the students with hand-on experience in mathematical concepts and algorithm related to Digital Image Processing.

INSTRUCTIONAL OBJECTIVES

1. To study the image fundamentals and mathematical transforms necessary for image processing.
2. To study the image enhancement techniques
3. To study image restoration procedures.
4. To study the image compression procedures.
5. To study the image segmentation and representation techniques.

UNIT I - FUNDAMENTALS OF IMAGE PROCESSING  (6 hours)

UNIT II - IMAGE ENHANCEMENT AND RESTORATION  (6 hours)

UNIT III - IMAGE SEGMENTATION AND FEATURE ANALYSIS  (6 hours)

UNIT IV - MULTI RESOLUTION ANALYSIS AND COMPRESSIONS  (6 hours)

UNIT V - APPLICATIONS OF IMAGE PROCESSING  (6 hours)

Practical:  (30 hours)
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PURPOSE

The purpose of this course is to give wider knowledge about the audio and video broadcasting systems across globally.

INSTRUCTIONAL OBJECTIVES

1. To gain knowledge about existing supporting technologies for broadcasting
2. To learn about various broadcast technologies
3. To gain knowledge about production components and transmitter systems hardware
4. To test and measure the performance of the broadcasting system

UNIT I - SUPPORTING TECHNOLOGIES (9 hours)

UNIT II - BROADCAST TECHNOLOGIES AND STANDARDS

(9 hours)

UNIT III - BROADCAST / STUDIO AND PRODUCTION COMPONENTS

(9 hours)

UNIT IV - BROADCAST SYSTEMS AND TRANSMITTER SYSTEMS HARDWARE

(9 hours)

UNIT V - TEST AND MEASUREMENT

(9 hours)

REFERENCES


28
PURPOSE
The main purpose of this course is to understand and analysis digital audio and speech

INSTRUCTIONAL OBJECTIVES
1. To understand the basic concepts of digital audio and speech
2. To gain knowledge about speech analysis and classification
3. To understand MIDI and audio usage in web
4. To understand audio signal processing and product manufacturing

UNIT I-INTRODUCTION (6 hours)
Digital audio, audio processing- handling audio in MATLAB-segmentation-visualization-sound generation-Speech: production-characteristics of speech, speech understanding

UNIT II-HEARING, COMMUNICATION AND AUDIO ANALYSIS (6 hours)
Psychoacoustics-Amplitude and frequency models-auditory scene analysis-speech communication- quantisation - parameterisation-audio analysis - analysis toolkit –speech analysis and classification

UNIT III-DIGITAL AUDIO (6 hours)
Digital audio technology-digital audio workstation-Groove tools and techniques

UNIT IV-MIDI AND AUDIO IN WEB (6 hours)
MIDI and electronic music technology- multimedia and the web-synchronization-amplifiers

UNIT V-SIGNAL PROCESSING (6 hours)
Signal processing-Noise reduction- Surround sound- Product manufacturing-studio tips and tricks

Practical: (30 hours)
REFERENCES


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PURPOSE

The goal of this course is to give you a solid foundation covering the major problems, challenges, concepts, and techniques dealing with the organization and management of knowledge with the help of computers.

INSTRUCTIONAL OBJECTIVES

1. To understand the fundamental concepts in the study of knowledge and its creation, acquisition, representation, dissemination, use and re-use, and management.

2. To critically evaluate current trends in knowledge management such as artificial intelligence, CBR, Data mining and their manifestation in business and industry.

3. To understand systems that create, capture, preserve and utilize knowledge

4. To understand the complexities involved in establishing a Knowledge management system in an enterprise.

5. To understand the advanced topics and case studies in knowledge management
UNIT I - INTRODUCTION (9 hours)
Introduction: An Introduction to Knowledge Management, Nature of Knowledge, Knowledge management Solutions, From Information Management to Knowledge Management, Knowledge management system life cycle, Organizational Impacts of Knowledge Management.

UNIT II - TECHNOLOGIES TO MANAGE KNOWLEDGE (9 hours)
Artificial Intelligence, Knowledge Based Systems, Case Based Reasoning Systems, Knowledge Elicitation: Converting Tacit Knowledge to Explicit Knowledge, Knowledge discovery through data mining.

UNIT III - KNOWLEDGE MANAGEMENT SYSTEMS (9 hours)
Knowledge Discovery Systems-Systems that create knowledge, Knowledge Capturing Systems-Systems that preserve and formalize knowledge, Capturing Tacit Knowledge, Knowledge Sharing Systems-Systems that organizes and distribute knowledge and Knowledge Application Systems-Systems that utilize knowledge.

UNIT IV - KNOWLEDGE CODIFICATION AND SYSTEM IMPLEMENTATION (9 hours)
Modes of Knowledge Conversion, Knowledge Codification, Codification tools and procedures, Implications for knowledge management, Knowledge Transfer and sharing – Role of Internet in knowledge Transfer

UNIT V - FUTURE TRENDS AND CASE STUDIES (9 hours)
The future of knowledge management, Advanced topics and case studies in knowledge management - Development of a knowledge management map/plan that is integrated with an organization's strategic and business plan - A case study on Corporate Memories for supporting various aspects in the process life-cycles of an organization.

REFERENCES


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**PURPOSE**
The course overview knowledge in E-commerce.

**INSTRUCTIONAL OBJECTIVES**
1. Understanding Mobile Application development features and trends
2. To provide knowledge on best practices for E-commerce design
3. To provide incisive knowledge in building E-commerce Systems
4. Enable students to understand software for E-commerce
5. Impart knowledge in e-payment systems and security issues
6. Learn E-commerce laws and ethics

**UNIT I–INTRODUCTION** *(6 hours)*

**UNIT II–BUILDING E-COMMERCE SYSTEMS** *(8 hours)*
Building E-commerce systems –software for E-commerce systems-Hardware for E-commerce systems-Scalability–E-commerce web system development life cycle-HCI for E-commerce: User experience design-Designing E-commerce for Mobile systems - Cloud services and computing in E-commerce

**UNIT III–E-COMMERCE SOFTWARES** *(6 hours)*
Multi tier architecture –web server software-Application server software-database software-Dynamic web page programming languages-MVC
Frameworks-E-commerce system tools and personalization tools – web site management tools-Intelligent Agents

UNIT IV–PAYMENT AND E-COMMERCE SECURITY  (6 hours)

UNIT V-E-COMMERCE MARKETING, LAWS, POLICIES AND ETHICS  (4 hours)
Marketing and promotion of e-business - E-commerce security policy, Laws and Cyber Forensics an overview- Ethics in E-commerce

PRACTICAL  (30 hours)

REFERENCES

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PURPOSE
Planning is a fundamental part of intelligent systems. This course aims to provide a foundation in artificial intelligence techniques for planning, with an overview of the wide spectrum of different problems and approaches, including their underlying theory and their applications.

INSTRUCTIONAL OBJECTIVES
1. Understand different planning problems
2. Have the basic know how to design and implement AI planning systems using state-space Planning
3. Know how to use AI planning technology for projects in different application domains using HTN (Hierarchical Task Network) Planning
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<td>Have the ability to make use of graph plan for the problems and developing its heuristics.</td>
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<td>Know how to plan the time and resources of the problem</td>
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**UNIT I-INTRODUCTION AND PLANNING IN CONTEXT**  (9 hours)
Introduction to planning-Conceptual model for planning-Representations for classical planning-Complexity of classical planning

**UNIT II-STATE-SPACE SEARCH**  (9 hours)
Heuristic Search and STRIPS-State-Space Planning-The STRIPS algorithm-Domain-Specific State Space Planning.

**UNIT III-PLAN-SPACE SEARCH AND HTN PLANNING**  (9 hours)

**UNIT IV-GRAPH PLAN AND ADVANCED HEURISTICS**  (9 hours)
Planning Graphs-The GraphPlan Planner-Constraint Satisfaction Techniques-Heuristics in Planning

**UNIT V-PLAN EXECUTION AND APPLICATIONS**  (9 hours)
Planning with Time and Resources-Time for Planning-Temporal Planning-Planning and Resource Scheduling-Case Studies and Applications

**REFERENCES**
Purpose

Cloud computing has drawn the attention of industries and researchers worldwide. Many applications that are being built nowadays were developed to suit the needs of cloud environment. Hence it becomes necessary to have course in cloud computing which deals with the basics of cloud, different services offered by cloud, and security issues in cloud. In a nutshell, this course on cloud computing provides information on fundamental aspects of the cloud environment.

Instructional Objectives

1. Learn about different deployment models of cloud and different services offered by cloud
2. Understand the technique of virtualization through theoretical concepts and practical training
3. Become knowledgeable in the rudimentary aspects of cloud application development

Unit I-Cloud Computing Basics (4 hours)

Cloud computing components- Infrastructure-services- storage applications-database services – Deployment models of Cloud- Services offered by Cloud- Benefits and Limitations of Cloud Computing – Issues in Cloud security-Cloud security services and design principles

Unit II-Virtualization Fundamentals (4 hours)

Virtualization – Enabling technology for cloud computing- Types of Virtualization- Server Virtualization- Desktop Virtualization – Memory Virtualization – Application and Storage Virtualization- Tools and Products available for Virtualization

Unit III-SaaS and PaaS (6 hours)

Getting started with SaaS- Understanding the multitenant nature of SaaS solutions- Understanding OpenSaaS Solutions- Understanding Service Oriented Architecture- PaaS- Benefits and Limitations of PaaS
UNIT IV-IAAS AND CLOUD DATA STORAGE (6 hours)
Understanding IaaS- Improving performance through Load balancing- Server Types within IaaS solutions- Utilizing cloud based NAS devices – Understanding Cloud based data storage- Cloud based backup devices- Cloud based database solutions- Cloud based block storage

UNIT V-CLOUD APPLICATION DEVELOPMENT (10 hours)

PRACTICAL (30 hours)

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PURPOSE
This module introduces students to developing web and cloud applications. By the end of the module the student will be able to build and deploy web and cloud-based application.

INSTRUCTIONAL OBJECTIVES
1. Use best practices in the design and development of elegant and flexible cloud software solutions.
2. Create, implement and deploy a cloud/LAMP based application.
3. Analyze a real world problem and develop a cloud/LAMP based software solution.
4. Contrast software development in the web, cloud and others
UNIT I - CLOUD BASED APPLICATIONS (4 hours)
Introduction, Contrast traditional software development and development for the cloud. Public v private cloud apps. Understanding Cloud ecosystems – what is SaaS/PaaS, popular APIs, mobile;

UNIT II - DESIGNING CODE FOR THE CLOUD (8 hours)

UNIT III - WEB DEVELOPMENT TECHNIQUES AND FRAMEWORKS (8 hours)
Building Ajax controls, introduction to Javascript using JQuery, working with JSON, XML, REST. Application development Frameworks e.g. Ruby on Rails, .Net, Java APIs or JSF; Deployment Environments – Platform As A Service (PAAS), Amazon, vmForce, Google App Engine, Azure, Heroku, AppForce

UNIT IV - USE CASE 1: BUILDING AN APPLICATION USING THE LAMP STACK (4 hours)
Setting up a LAMP development environment. Building a simple Web app demonstrating an understanding of the presentation layer and connectivity with persistence.

UNIT V USE CASE 2: DEVELOPING AND DEPLOYING AN APPLICATION IN THE CLOUD (6 hours)
Building on the experience of the first project students will study the design, development, testing and deployment of an application in the cloud using a development framework and deployment platform.

PRACTICAL (30 hours)

REFERENCES

## AMENDMENTS

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