
### I SEMESTER

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MA0533</td>
<td>Mathematical Foundations of Computer Science</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0541</td>
<td>Artificial Intelligence &amp; Intelligent Systems</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>CS0543</td>
<td>Knowledge Based System Design</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>CS0545</td>
<td>Data &amp; Knowledge Mining</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Elective – I</td>
<td></td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>15</td>
<td>4</td>
<td>3</td>
<td>18</td>
</tr>
</tbody>
</table>

### II SEMESTER

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS0540</td>
<td>Semantic Web</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>CS0542</td>
<td>Knowledge Based Neural Computing</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>CS0544</td>
<td>Agent Based Learning</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Elective – II</td>
<td></td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Elective – III*</td>
<td></td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>15</td>
<td>4</td>
<td>3</td>
<td>18</td>
</tr>
</tbody>
</table>

*Elective – III shall be an Inter Departmental (or) Inter School Elective

### III SEMESTER

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective – IV</td>
<td></td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Elective - V</td>
<td></td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Elective - VI</td>
<td></td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0550</td>
<td>Seminar</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Practical</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS0645</td>
<td>Project Phase - I</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>9</td>
<td>2</td>
<td>12</td>
<td>16</td>
</tr>
</tbody>
</table>

### IV SEMESTER

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0646</td>
<td>Project Phase - II</td>
<td>0</td>
<td>0</td>
<td>36</td>
<td>18</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>0</td>
<td>0</td>
<td>36</td>
<td>18</td>
</tr>
</tbody>
</table>

**TOTAL CREDITS TO BE EARNED : 70**
### Electives for First Semester

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0685</td>
<td>Multimedia Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0561</td>
<td>Geographical Information Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0563</td>
<td>Professional Studies</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0553</td>
<td>Genetic Algorithms &amp; Machine Learning</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

### Electives for Second Semester

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0650</td>
<td>Pattern Recognition Techniques</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0693</td>
<td>Grid Computing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0578</td>
<td>Human Interface System Design</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0572</td>
<td>Decision Support Systems</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0641</td>
<td>Reasoning under Uncertainty</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0643</td>
<td>Fuzzy Expert systems &amp; Fuzzy Reasoning</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

### Electives for Third Semester

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0655</td>
<td>Data Warehousing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0683</td>
<td>Speech and Language Processing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0663</td>
<td>Deductive &amp; Inductive Reasoning</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0665</td>
<td>Bio Informatics</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0681</td>
<td>Machine Vision</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0673</td>
<td>Software Reuse</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0546</td>
<td>Spatio -Temporal Reasoning</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0562</td>
<td>Digital Image Processing</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>CS0689</td>
<td>Embedded Technology</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

### ASSESSMENT PROCEDURE

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Examinations</th>
<th>Weightage in %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Course with Practical</td>
</tr>
<tr>
<td>Continuous</td>
<td>1. Announced Quiz</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>2. Unannounced Quiz</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>3. Test – I</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>4. Test – 2</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>6. Review – I</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>7. Review – 2</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>8. Review - 3</td>
<td>--</td>
</tr>
<tr>
<td>Final Theory</td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>Final Practical</td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>Final Review</td>
<td></td>
<td>--</td>
</tr>
<tr>
<td>Term Paper/Thesis</td>
<td></td>
<td>--</td>
</tr>
</tbody>
</table>

2
**MA0533**  
**MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE**  
**L T P C**  
3 0 0 3


**TEXT BOOKS**

**REFERENCE BOOKS**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0541</td>
<td>ARTIFICIAL INTELLIGENCE AND INTELLIGENT SYSTEMS</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

**PURPOSE**
The purpose of this course is to give students a comprehensive understanding of Artificial Intelligence and Intelligent Systems in the context of Knowledge Engineering.

**INSTRUCTIONAL OBJECTIVES**
- To provide a strong foundations of fundamental concepts in Artificial Intelligence
- To get familiar with the various applications of these techniques in Intelligent Systems.

Representation Of Knowledge And Reasoning Methods : Intelligent Agents – Knowledge representation – First-Order Logic – Inference In First-Order Logic – AI and Internal Representation
Game Playing, Planning, Understanding, Common Sense - Advanced Topics: Game Playing, Planning, Understanding, Common Sense

**Practicals:**
1. DFS And BFS implementation
2. Game playing : single,two palyers(Using Heuristic Function)
3. A* Algorithm
5. Develop an Expert system
TEXT BOOKS

REFERENCE BOOKS:
3. Ivan Bratko: “Prolog: Programming for Artificial Intelligence”, Pearson Education

CS0543
KNOWLEDGE BASED SYSTEM DESIGN

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisite</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

PURPOSE
This course provides a comprehensive view of Knowledge Based System Design in the context of Knowledge Engineering

INSTRUCTIONAL OBJECTIVES
By the end of the course, students will satisfy the following objectives
- To understand the concepts of Knowledge Based System Design
- To understand the components of Knowledge Based Systems
- To understand the issues and approaches in Knowledge Based System Design


TEXT BOOKS

REFERENCE BOOKS:

CS0545
DATA & KNOWLEDGE MINING

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisite</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

PURPOSE
This course provides a complete overview of Data mining and knowledge mining techniques.

INSTRUCTIONAL OBJECTIVES
By the end of the course, students will be able to
- To understand the concepts of Data Mining
Classification and prediction and cluster analysis techniques
Applications of Data and knowledge mining

Introduction To Data Mining – Kind Of Data – Functionalities – Interesting Patterns – Task Primitives – Issues In Data Mining - Data Preprocessing: Why Preprocessing? – Data Summarization – Data Cleaning, Integration, Transformation, Reduction; Mining Frequent Patterns, Associations And Correlations - Basic Concepts – Frequent Item Set Mining Methods – Mining Various Kinds Of Association Rules – Correlation Analysis – Constraint Based Association Mining
Classification And Prediction - Issues Regarding Classification And Prediction – Decision Tree Induction Classification – Bayesian, Rule Based Classification – Support Vector Machine
Prediction: Linear, Non-Linear Regression – Accuracy And Error Measures; Cluster Analysis - What Is Cluster Analysis? Types Of Data In Cluster Analysis – A Categorization Of Major Clustering Methods – Hierarchical Methods – Model Based Methods – Constraint Based Cluster Analysis
Applications And Trends In Data Mining - Data Mining Applications – Products And Research Prototypes – Additional Themes On Data Mining – Social Impacts Of Data Mining – Trends In Data Mining

TEXT BOOK

REFERENCE BOOKS

SEMESTER – II

<table>
<thead>
<tr>
<th>Prerequisite</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0540 SEMANTIC WEB</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

PURPOSE
This course introduces semantic web technologies and web services

INSTRUCTIONAL OBJECTIVES
By the end of the course, students will be able to
• To understand the concepts of semantic web technology
• Semantic web services and applications
• RDF,OWL,UDDI,OWL-S,WSDL-S technologies

Web services – web services standards – web services to semantic web services- UDDI- Concept of OWL-S – building blocks of OWL-S- mapping OWL-S to UDDI- WSDL-S overview

TEXT BOOK

REFERENCE BOOKS
CS0542 KNOWLEDGE BASED NEURAL COMPUTING

Prerequisite
CS0543

PURPOSE
This course introduces the representation and extraction of data and rules by applying Neural Networks.

INSTRUCTIONAL OBJECTIVES
By the end of the course, students will be able to
- Neural Network architectures for rule extraction
- Data mining techniques for NN, Decision tree and rule extraction from NN
- Case studies and applications

Architectures and techniques for knowledge based Neurocomputing- Metalevel architecture- Symbolic knowledge representation – Neural Networks- Recurrent Architecture- Automata to Recurrent networks- Extraction of rules from recurrent neural networks- Structural learning methods- learning with forgetting- Prediction of Time series- Adaptive learning- rule extraction and discovery- Transformation of rules to ANN- Integration of Heterogeneous sources of Partial Domain Knowledge- Data Mining techniques for Neural Network: Direct and Indirect Information extraction procedures; - Decision trees from ANN : Extraction of rules from Neural Networks- ANN-DT Algorithm for rule extraction- Case studies – Extraction of Linguistic rules from Data via NN – Neural Knowledge processing in Expert Systems

Practicals
- Simulate an XOR function using FF Network
- Implement BPN Algorithm
- Implement Recurrent Architecture
- Implement Adaptive learning in ANN
- Extraction of rules from ANN

TEXT BOOK
1. Ian Cloete, Jacek M.Zurada, “Knowledge based NeuroComputing”, University Press(India) ,2002

REFERENCE BOOKS
Eyal Kolman , Michael Margaliot ,”Knowledge-Based Neurocomputing: A Fuzzy Logic approach”, Springer

CS0544 AGENT BASED LEARNING

Prerequisite
Nil

PURPOSE
The course gives a comprehensive understanding on software agents.

INSTRUCTIONAL OBJECTIVES
This course introduces the students to
1. The characteristics of the agents,
2. The design and implementation of Agents
3. The implementation described in the architecture level.

TEXT BOOKS

REFERENCE BOOKS

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0550</td>
<td>SEMINAR</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Prerequisite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Students shall be encouraged to choose any latest research topics related to their specialization and present them in the seminar hours.

ELECTIVES FOR FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0685</td>
<td>MULTIMEDIA SYSTEMS</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Prerequisite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
To study the tools and applications of Multimedia Systems

INSTRUCTIONAL OBJECTIVES
- To learn the devices and tools for generating and representing multimedia
- To study the text and images in multimedia
- Learning how to organize the Multimedia Project and building intelligent systems


TEXT BOOK

REFERENCE BOOKS

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS0561</td>
<td>GEOGRAPHICAL INFORMATION SYSTEMS</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Prerequisite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
To understand the Geographical Information Systems and techniques

INSTRUCTIONAL OBJECTIVES:
- To identify, manipulate and analyze spatial data using state-of-the-art software
To view, understand, question, interpret, and visualize data in many ways that reveal relationships, patterns, and trends in the form of maps, globes, reports, and charts.

**Fundamentals of GIS:** What is GIS – Introduction Defining GIS – Components of a GIS – Spatial data – Introduction - Maps and their influence on the character of spatial data – Other sources of spatial data.


**TEXTBOOK**
Ian Heywood, Sarah Cornelius, Steve carver. Introduction to geographical information systems Pearson Education

**REFERENCE BOOKS**

<table>
<thead>
<tr>
<th>CS0563</th>
<th>PROFESSIONAL STUDIES</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prerequisite</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PURPOSE**
This course provides a comprehensive professional development in the context of knowledge engineering

**INSTRUCTIONAL OBJECTIVES**
At the end of this course, student should be able

- To use text, images, sounds and video to deliver messages and content in meaningful ways
- To apply advanced knowledge to hard skills (the technical abilities) and to soft skills (also called human skills – interpersonal competences, leadership, etc.).

Communications - Peak performance – Identifying and overcoming communication barriers and incompatibilities – The basics of body language - Gathering and Giving Information - Reflective listening of domain experts – Cooperation and commitment – Assertiveness, harmony and persuasiveness – Distinguishing between fact, fantasy, folklore and feelings – Create important documentation - Presentation Skills - Mastering several different programming languages and presentation tools

TEXT BOOK

REFERENCE BOOK

<table>
<thead>
<tr>
<th>CS0553</th>
<th>GENETIC ALGORITHMS &amp; MACHINE LEARNING</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

PREREQUISITE
Nil

PURPOSE
This course gives a complete understanding of the concepts of Genetic algorithm

INSTRUCTIONAL OBJECTIVES
- Mathematical foundations for Genetic algorithm, operators
- Applications of Genetic Algorithms
- Genetic based machine learning and its applications


TEXT BOOKS

REFERENCE BOOK

ELECTIVES FOR SECOND SEMESTER

<table>
<thead>
<tr>
<th>CS0650</th>
<th>PATTERN RECOGNITION TECHNIQUES</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

PREREQUISITE
Nil

PURPOSE
To study the Pattern Recognition techniques and its applications

INSTRUCTIONAL OBJECTIVES
- To learn the basics of Pattern Classifier
- To learn Feature extraction, Classification and Recognition techniques
- To learn recent advances in pattern classification

TEXT BOOK

REFERENCE BOOKS
5. C.M.Bishop, Neural Networks for Pattern Recognition, Oxford University Press, 1995.

<table>
<thead>
<tr>
<th>CS0578</th>
<th>HUMAN INTERFACE SYSTEM DESIGN</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prerequisite</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
This course on user Interface Design provides a basic understanding of interface design and principles

INSTRUCTIONAL OBJECTIVES
• Design process management
• Interaction devices and windows strategies
• Managing virtual environments

TEXT BOOK

REFERENCE BOOKS

CS0572  DECISION SUPPORT SYSTEMS  

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

PREREQUISITE
Nil

PURPOSE
This course enables to study the architecture and implementations of Decision Support Systems

INSTRUCTIONAL OBJECTIVES
- Architecture of DSS
- Modelling and Analysis
- Knowledge based Decision support


TEXT BOOKS

REFERENCE BOOKS
### Course Details

**CS0641: REASONING UNDER UNCERTAINTY**

- **Prerequisite:** Nil

**Purpose:**
This course presents a detailed knowledge of Uncertainty representations, systems and its applications.

**Instructional Objectives:**
- Uncertainty and its representations
- Reasoning with imperfect information
- Application of uncertain systems


**Text Book**
Joseph Y Halpern, ”Reasoning about uncertainty”, MIT Press, 2005

**Reference Books**
Simon Parsons, "Qualitative methods for Reasoning under uncertainty”, MIT Press 2001
Timothy J Ross, “Fuzzy Logic with Engineering Applications”, Wiley, 2004

---

### Course Details

**CS0643: FUZZY EXPERT SYSTEMS AND FUZZY REASONING**

- **Prerequisite:** Nil

**Purpose:**
This course presents a detailed knowledge of Fuzzy logic principles, fuzzy expert systems and its applications.

**Instructional Objectives:**
- Fuzzy sets and representations
- Inference in Fuzzy Expert systems
- Running and debugging Fuzzy Expert systems


TEXT BOOK

REFERENCE BOOK

ELECTIVES FOR THIRD SEMESTER

<table>
<thead>
<tr>
<th>CS0655</th>
<th>DATA WAREHOUSING</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prerequisite</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
This course enable us to understand the concepts of Data Warehousing and Data Mining And its applications

INSTRUCTIONAL OBJECTIVES
- OLTP and Developing a Data Warehouse
- Data mining techniques and algorithms
- Data Mining environments and applications


TEXT BOOK

REFERENCE BOOKS
**CS0683 SPEECH AND LANGUAGE PROCESSING**

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**Prerequisite**
Nil

**Purpose**
This course provides a thorough understanding of speech and language processing techniques.

**Instructional Objectives**
- Basics of Speech technology, parsing
- Presentation and semantic analysis of speech
- Machine translation


**Text Book**

**Reference Books**

**CS0663 DEDUCTIVE AND INDUCTIVE REASONING**

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

**Prerequisite**
Nil

**Purpose**
This course presents a detailed knowledge of principles of deductive and inductive reasoning, fallacies and their applications.

**Instructional Objectives**
- Definitions and approaches to Deductive Reasoning
- Inductive methods and their fallacies
- Applications of deductive and inductive reasoning


TEXT BOOK
2. Theses by Monique Van der straaten, 2003

REFERENCE BOOK

<table>
<thead>
<tr>
<th>CS0665</th>
<th>BIOINFORMATICS</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prerequisite</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

PURPOSE
To explore how biological information could be stored in digital form to create bioinformatics resources and to process it.

INSTRUCTIONAL OBJECTIVES
1. Different coding techniques and standards, biological web resources available
2. To analyze DNA and Protein sequences
3. To understand protein classification and Structure prediction


TEXT BOOKS

REFERENCE BOOKS
**CS0681 MACHINE VISION**

**L T P C**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>3</th>
<th>0</th>
<th>0</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisite</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PURPOSE**

This course deals with complete understanding of Computer Vision techniques

**INSTRUCTIONAL OBJECTIVIES**

- Image processing basics
- 2D and 3D vision fundamentals
- Segmentation, Clustering and Recognition
- Filters - Binary Images - Features - Edge Detection – Texture – Shape - Segmentation
- Clustering - Model Fitting – Probabilistic - 3D Vision - Multiview geometry - Stereo
- Shape from X - 3D data - Dynamic Sequences - Optical Flow - Structure from Motion
- Tracking - Kalman Filter based – Condensation - Recognition – Representations - Appearance Based

**TEXT BOOKS**


---

**CS0673 SOFTWARE REUSE**

**L T P C**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>3</th>
<th>0</th>
<th>0</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisite</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PURPOSE**

This course explains the various developments and metrics used in development of software reusable components

**INSTRUCTIONAL OBJECTIVIES**

- Metrics used in software reusable components
- Development of reusable components
- Reuse in business

Software Reuse success Factors- Change in process - Change in Organization-set of Principles- Reuse Cost effective-software Engineering Processes- Establishing & Managing a Reuse business.


**TEXT BOOK**


**REFERENCE BOOKS**

CS0546  SPATIO TEMPORAL REASONING  

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Prerequisite
Nil

**PURPOSE**

This course presents a detailed knowledge of Spatial and temporal based reasoning techniques and their applications.

**INSTRUCTIONAL OBJECTIVES**

- Spatial reasoning and representations
- Temporal problems and solutions
- Applications of spatio-temporal reasoning


Applications - A generic model for spatio-bi-temporal geographic Information – process dynamics, temporal extent and casual propagation as the basis for linking space and time – relationship between geographic scale, distance and time as expressed in natural discourse – acquiring spatio-temporal knowledge from language – analyzing temporal factors in urban morphology development-The cognitive atlas – using GIS as a metaphor for Memory

**TEXT BOOKS**

3. Reference notes by Daniel Hernandez and Amitava Mukherjee, Leon Planken

CS0562  DIGITAL IMAGE PROCESSING

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Prerequisite
Nil

**PURPOSE**

This course provides a complete understanding of the various image processing techniques

**INSTRUCTIONAL OBJECTIVES**

- Image fundamentals and techniques
- Image transforms, enhancement , restoration and compression
- Image reconstruction operations


TEXT BOOK

REFERENCE BOOKS

<table>
<thead>
<tr>
<th>CS0689</th>
<th>EMBEDDED TECHNOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L</td>
</tr>
<tr>
<td>Prerequisite</td>
<td>3</td>
</tr>
<tr>
<td>Nil</td>
<td></td>
</tr>
</tbody>
</table>

PURPOSE
To study the architecture of microcontrollers and embedded microcomputer systems.

INSTRUCTIONAL OBJECTIVES
• To understand the architecture of PIC microcontroller
• To understand the architectures and applications of embedded microprocessor based systems.
• To know cross compilers and debugging strategies
• To understand the basic design issues of real time OS


TEXT BOOKS

REFERENCE BOOKS