**Swarnandhra College of Engineering & Technology**

**Autonomous and recognized under 2(F) and 12(B) by UGC**

Recognized by AICTE, permanently affiliated to JNTUK Kakinada

Accredited by NAAC with 'A' Grade (2nd Cycle)

**Seetharamapurm, Narsapur – 530280 (Andhra Pradesh)**

DEPARTMENT OF INFORMATION TECHNOLOGY

TEACHING PLAN

| Course Code | Course Title | Semester | Branch | Contact Periods /Week | Academic Year | Date of commencement of Semester |
|---|---|---|---|---|---|---|
| 20IT5T02 | **Artificial Intelligence** | V | CBS | 5 | 2024-2025 | 03-06-2024 |

**COURSE OUTCOMES**

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|---|---|
| 1 | Define the fundamentals of AI techniques and search techniques. |
| 2 | Use appropriate search algorithms for any AI problem. |
| 3 | Represent a problem using first order and predicate logic. |
| 4 | Understand the concepts of non-monotonic reasoning. |
| 5 | Acquire the knowledge of various AI applications |

| UNIT | Out Comes / Bloom's Level | Topics No. | Topics/ Activity | Text Book/ Reference | Contact Hours | Delivery Method |
|---|---|---|---|---|---|---|
| | | **1** | **Introduction** | | | |
| | | **1.1** | Artificial Intelligence definition - Introduction | **T1,T2,T3** | **2** | **Chalk & Board** |
| | | **1.2** | AI problems, Problem Spaces | **T1,T2,T3** | **1** | |
| | | **1.3** | Defining the Problem as a State Space Search, | **T1,T2,T3** | **1** | **Power point presentations** |
| **I** | **CO – 1** | **1.4** | problem characteristics, production Systems. | **T1,T2,T3** | **2** | |
| | | **1.5** | Future of Artificial Intelligence | **T1,T2,T3** | **1** | **Assignment** |
| | | **1.6** | Characteristics of Intelligent Agents | **T1,T2,T3** | **2** | **Test** |
| | | **1.7** | Typical Intelligent Agents – Problem Solving | **T1,T2,T3** | **2** | |
| | | **1.8** | Approach to Typical AI | **T1,T2,T3** | **2** | |

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|---|---|---|---|---|---|---|
| | | | problems | | | |
| | | 1.9 | Cryptarithmetic problem | T1,T2,T3 | 2 | |
| | | 1.10 | Missionaries and Cannibals problem | T1,T2,T3 | 1 | |
| | | 1.11 | Problem solving | T1,T2,T3 | 1 | |
| | | | | Total | 17 | |
| | | 2 | Problem solving Methods | | | |
| | | 2.1 | Issues in the design of search program | T1,T2,T3 | 1 | |
| | | 2.2 | Search Strategies- Uninformed (BFS and DFS | T1,T2,T3 | 1 | |
| | | 2.3 | Informed (Heuristic) - Local Search Algorithms and Optimization Problems | T1,T2,T3 | 1 | Chalk & Board |
| | | 2.4 | Generate-And- Test, Hill Climbing | T1,T2,T3 | 1 | |
| II | CO – 2 | 2.5 | Best-First Search, A* Algorithm | T1,T2,T3 | 2 | Power point presentations |
| | | 2.6 | Problem Reduction, AO*Algorithm) | T1,T2,T3 | 2 | Assignment |
| | | 2.7 | Constraint Satisfaction Problems, | T1,T2,T3 | 1 | Test |
| | | 2.8 | Backtracking Search | T1,T2,T3 | 1 | |
| | | 2.9 | Game Playing - Optimal Decisions in Games – | T1,T2,T3 | 1 | |
| | | 2.10 | Minimax Search, Alpha - Beta Pruning | T1,T2,T3 | 1 | |
| | | 2.11 | Stochastic Games | T1,T2,T3 | 1 | |
| | | | | Total | 13 | |
| | | 3 | Knowledge Representation | | | Chalk & Board |
| | | 3.1 | Knowledge Representation | T3,R1 | 1 | |
| | | 3.2 | Representing Simple Facts in Predicate Logic | T3,R1 | 1 | Power point presentations |
| | | 3.3 | First Order Predicate Logic(FOPL) | T3,R1 | 1 | |
| III | CO – 3 | 3.4 | Prolog Programming Unification | T3,R1 | 1 | Assignment |
| | | 3.5 | Forward Chaining, Backward Chaining | T3,R1 | 1 | Test |
| | | 3.6 | Resolution | T3,R1 | 1 | |
| | | 3.7 | Natural Deduction | T3,R1 | 1 | |

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| | | 3.8 | Ontological Engineering, Categories and Objects | T3,R1 | 1 | |
| | | 3.9 | Events, Mental Events and Mental Objects | T3,R1 | 1 | |
| | | 3.10 | Reasoning Systems for Categories | T3,R1 | 1 | |
| | | 3.11 | Reasoning with Default Information | T3,R1 | 1 | |
| | | | | Total | 11 | |
| IV | CO – 4 | 4 | **Uncertain Knowledge and Reasoning** | | | Chalk & Board<br>Power point presentations<br>Assignment<br>Test |
| | | 4.1 | Introduction to Non-Monotonic Reasoning | T1,T2,T3 | 1 | |
| | | 4.2 | acting under Uncertainty | T1,T2,T3 | 1 | |
| | | 4.3 | Basic Probability Notation | T1,T2,T3 | 1 | |
| | | 4.4 | Inference Using Full Joint Distributions | T1,T2,T3 | 1 | |
| | | 4.5 | Bayes' Rule and Its Use,Independence | T1,T2,T3 | 1 | |
| | | 4.6 | Representing Knowledge in an Uncertain Domain | T1,T2,T3 | 1 | |
| | | 4.7 | Probability and Bayes Theorem | T1,T2,T3 | 1 | |
| | | 4.8 | The Semantics of Bayesian Networks | T1,T2,T3 | 1 | |
| | | | | Total | 8 | |
| V | CO – 5 | 5.1 | **AI Applications** | T1,T3,R1 | 1 | Chalk & Board<br>Power point presentations<br>Assignment<br>Test |
| | | 5.2 | Language Models | T1,T3,R1 | 1 | |
| | | 5.3 | Information Retrieval | T1,T3,R1 | 1 | |
| | | 5.4 | Information Extraction | T1,T3,R1 | 1 | |
| | | 5.5 | Expert Systems | T1,T3,R1 | 1 | |
| | | 5.6 | Natural Language Processing | T1,T3,R1 | 1 | |
| | | 5.7 | Machine Translation-Speech Recognition | T1,T3,R1 | 1 | |
| | | 5.8 | Robot-Hardwar, Perception ,Planning, Moving | T1,T3,R1 | 1 | |
| | | | | Total | 07 | |
| **CUMULATIVE PROPOSED PERIODS** | | | | | 57 | |

**Text Books:**

| S. No. | AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION |
|---|---|
| 1 | S. Russell and P. Norvig, "Artificial Intelligence: A Modern Approach", Prentice Hall, Third Edition, 2009. |
| 2 | Saroj Kaushik, "Artificial Intelligence", Cengage Learning India, 2011 |
| 3 | Artificial Intelligence, Elaine Rich, Kevin Knight, Shiva Sankar B. Nair, The McGraw Hill publications, Third Edition, 2017. |
| 4 | Bratko, —Prolog: Programming for Artificial Intelligence", Fourth edition, Addison-Wesley Educational Publishers Inc., 2011. |

**Reference Books:**

| S. No. | AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION |
|---|---|
| 1 | George F. Luger, Artificial Intelligence: Structures and Strategies for Complex Problem Solving, Pearson Education, 6th ed., 2009. |
| 2 | David Poole and Alan Mackworth, "Artificial Intelligence: Foundations for Computational Agents", Cambridge University Press 2010. |

**Web Details:**

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|---|---|
| 1 | https://nptel.ac.in/courses/106105077 |
| 2 | https://nptel.ac.in/courses/106106126 |
| 3 | https://aima.cs.berkeley.edu |
| 4 | https://ai.berkeley.edu/project_overview.html |

| | | Name | Signature with Date |
|---|---|---|---|
| i. | Course Coordinator | Mr.M.N.V.L.Narayana | |
| ii. | Module Coordinator | Dr. RVVSV Prasad | |
| iii. | Programme Coordinator | Dr. RVVSV Prasad | |

Principal