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| Course Code | | 21CSC206T | | | Course Name | | | Artificial Intelligence | | | | Course Category | | | C | | | | Professional Core | | | | | | | | | | | | | L | | T | | P | | C | |
| 2 | | 1 | | 0 | | 3 | |
| Pre-requisite Courses | | | | Nil | | | | | Co-requisite Courses | Nil | | | Progressive Courses | | | | | | | Nil | | | | | | | | | | | | | | | | | | | |
| Course Offering Department | | | | | | Computational Intelligence | | | | | Data Book / Codes/Standards | | Nil | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Course Learning Rationale (CLR): | | | | | | | The purpose of learning this course is to: | | | | | | |  | |  | | Program Outcomes (PO): | | | | | | | | | | | | | | | | | | | | |
| CLR-1 : | | | Infer knowledge in problem formulation with AI. | | | | | | | | | | |  | |  | 1 | | | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | 13 | | 14 | | 15 | |
| CLR-2 : | | | Exemplify the uninformed and informed search technique procedures for real world problems | | | | | | | | | | |  | |  | Engineering Knowledge | | | | Problem Analysis | Design & Development | Analysis, Design, Research | Modern Tool Usage | Society & Culture | Environment & Sustainability | Ethics | Individual &Team Work | Communication | Project Mgt. & Finance | Life Long Learning | | PSO - 1 | | PSO – 2 | | PSO – 3 | |
| CLR-3 : | | | Understand the adversarial search methods, constraint satisfaction problems and intelligent agents. | | | | | | | | | | |  | |  |
| CLR-4 : | | | Demonstrate various knowledge representation techniques | | | | | | | | | | |  | |  |
| CLR-5 : | | | Infer knowledge about expert systems. | | | | | | | | | | |  | |  |
|  | | |  | | | | | | | | | | |  | |  |
| Course Outcomes (CO): | | | | | | | At the end of this course, learners will be able to: | | | | | | | | |  |
| CO-1 | Formulate a problem as a state space search method and its solution using various AI techniques | | | | | | | | | | | | | | |  | 1 | | | | 2 | - | - | - | - | - | - | - | - | - | - | | - | | 2 | | - | |
| CO-2 | Apply appropriate searching techniques to solve a real-world problem | | | | | | | | | | | | | | |  | 1 | | | | 2 | 3 |  | - | - | - | - | - | - | - | - | | - | | - | | - | |
| CO-3 | Develop various game playing strategies to solve real world adversarial search problems | | | | | | | | | | | | | | |  |  | | | | 2 | 2 |  | - | - | - | - | - | - | - | - | | - | | - | | - | |
| CO-4 | Represent various knowledge representation techniques to solve complex AI problems | | | | | | | | | | | | | | |  | 1 | | | | 2 | - |  | - | - | - | - | - | - | - | - | | - | | 2 | | - | |
| CO-5 | Design an expert system to implement advance techniques in Artificial Intelligence | | | | | | | | | | | | | | |  | 3 | | | | 2 | 3 |  | - | - | - | - | - | - | - | - | | 1 | | - | | - | |

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| Unit-1  Introduction to AI- AI techniques, Problem solving with AI, AI Models, Data acquisition and learning aspects in AI, Problem solving- Problem solving process, formulating problems, Problem types and characteristics, Problem space and search, Toy Problems – Tic-tac-toe problems, Missionaries and Cannibals Problem, Real World Problem – Travelling Salesman Problem |
| Unit-2  Basic introduction to stacks, queues, trees and graphs - General Search Algorithms – Searching for solutions – Problem-solving agents – Control Strategies – Uninformed Search Methods – Breadth First Search –Uniform Cost Search - Depth First Search -Depth Limited Search – Informed search - Generate and test - Best First search - A\* Algorithm |
| Unit-3  Adversarial Search Methods (Game Theory) - Mini max algorithm - Alpha beta pruning - Constraint satisfactory problems – Constraints – Crypt Arithmetic Puzzles – Constraint Domain – CSP as a search problem (Room colouring).  Intelligent Agent – Rationality and Rational Agent – Performance Measures – Rationality and Performance – Flexibility and Intelligent Agents – Task environment and its properties – Types of agents. |
| Unit-4  Knowledge Representation – Knowledge based agents – The Wumpus world – Propositional Logic - syntax, semantics and knowledge base building - inferences – reasoning patterns in propositional logic – predicate logic – representing facts in logic: Syntax and semantics – Unification – Unification Algorithm - Knowledge representation using rules - Knowledge representation using semantic nets - Knowledge representation using frames inferences - Uncertain Knowledge and reasoning Methods. |
| Unit-5  Planning – planning problem – Simple planning agent – Blocks world problem – Mean Ends analysis  Learning - Machine learning - Learning concepts, methods and models  Introduction to expert system – architecture of expert systems. |

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| Learning  Resources | 1. Parag Kulkarni, Prachi Joshi, Artificial Intelligence –Building Intelligent Systems, 1st ed., PHI learning, 2015 2. Stuart Russel and Peter Norvig, “Artificial Intelligence: A Modern Approach”, Fourth Edition, Pearson Education, 2020. | 1. Deepak Kemhani,First course in Artificial Intelligence,McGraw Hill Pvt Ltd, 2013 2. Data Structures Schaum's Outlines Series, Seymour, Lipschutz, 2014. |

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|  | Bloom’s  Level of Thinking | **Continuous Learning Assessment (CLA)**  **- By the Course Faculty** | | | | **By The CoE** | |
| **Formative**  CLA-I Average of  unit test  (50%) | | **Life Long\***  **Learning**  CLA-II- Practice  (10%) | | **Summative**  Final  Examination  (40% weightage) | |
| Theory | Practice | Theory | Practice | Theory | Practice |
| Level 1 | Remember | 10% | - | 5% | - | 5% | - |
| Level 2 | Understand | 10% | - | 5% | - | 10% | - |
| Level 3 | Apply | 10% | - | 5% | - | 10% | - |
| Level 4 | Analyze | 5% | - | - | - | 10% | - |
| Level 5 | Evaluate | 10% | - | - | - | 15% | - |
| Level 6 | Create | - | - | - | - | - | - |
|  | Total | 100 % | | 100 % | | 100 % | |

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| Course Designers |  |  | |  |  |  | |  |
| Experts from Industry | | | Experts from Higher Technical Institutions | | | | Internal Experts | |
| Mr. Tejas Gowda, Co-Founder & Chief Data Scientist, TenzAI | | | Dr. T. Senthilkumar, Associate Professor, Amrita School of Engineering, Amrita Vishwa Vidyapeetham | | | | Dr. A. Alice Nithya, SRMIST  Dr. K. Senthil Kumar, SRMIST | |