Semester	**FOUR**
Paper Number	**14**
Paper Code	**MDTS 4412**
Paper Title	**Artificial Intelligence**
No. of Credits	**6**
Course description	DISCIPLINE SPECIFIC ELECTIVE
Course Objective	This is designed to be an introductory course in Artificial Intelligence. The goal is to acquire knowledge on the basics of AI, intelligent systems and agents, heuristic search techniques, formalization of knowledge, reasoning with and without uncertainty and their implementation of these using a suitable programming language. Thus the student should be able to acquire the knowledge and application of basic principles and techniques of intelligent systems and their applications. The basic course objectives are thus as follows: 1. Formalization and design of systems capable of automated reasoning. 2. Implementation and application of these systems using PROLOG programming language. 3. Brief introduction to concepts leading to advanced topics like machine learning, data mining and robotics.
Syllabus	**Introduction:** Introduction to Artificial Intelligence, Background and Applications, Turing Test. **(5)** **Agent Based System:** **(6)** Rational Agent approaches to AI, Introduction to Intelligent Agents, their structure, behavior and environment **Problem Solving and Searching Techniques:** **(15)** Problem Characteristics, Production Systems, Control Strategies, Breadth First Search, Depth First Search, Hill climbing, Heuristics Search Techniques: Best First Search, Constraint Satisfaction Problem, Means-End Analysis. **Game Playing:** **(5)** Minmax and game trees, refining minmax, Alpha – Beta pruning. **Knowledge Representation:** **(13)** Introduction to First Order Predicate Logic, Resolution Principle, Unification, Semantic Nets, Conceptual Dependencies, Frames, Production Rules, Conceptual Graphs. **Dealing with Uncertainty and Inconsistencies:** **(6)** Truth Maintenance System, Default Reasoning, Probabilistic Reasoning, Bayesian Probabilistic inference, Possible World Representations.

	Ethical and Social Implications of AI: **(2)** Bias and fairness in AI systems; Privacy and data protection concerns; Impact of AI on employment and the workforce; AI and social inequality; Ethical guidelines and responsible AI practices.

Practical Component	Practical based on the theory component.	
Reading/Reference Lists	1. S. Russell and P. Norvig, Artificial Intelligence: A Modern Approach, Pearson Education, 2006. 2. Elaine Rich and Kelvin Knight, Artificial Intelligence, Tata McGraw Hill, 2002. 3. Nils J Nilson, Artificial Intelligence: A New Synthesis, Morgan Kaufmann Publishers, Inc., San Francisco, California, 2000. 4. W.F. Clocksin and C.S. Mellish, Programming in PROLOG, Narosa Publishing House, 2002. 5. Ivan Bratko, Prolog Programming for Artificial Intelligence, Pearson, 2018. 6. A First Course in Artificial Intelligence, Deepak Khemani, McGraw-Hill India (2008); Amazon link: https://www.amazon.com/First-Course-Artificial-Intelligence/dp/1259029980	
Evaluation	Theory CIA: 10 End Sem Exam: 50 Total : 60	Practical Continuous Assessment Total: 40
Paper Structure for End Semester Theory	Short questions: 5 marks each	Long questions: 10 marks each
	2 out of 4	4 out of 6