

Subject Code: 01ME0842
Subject Name: Artificial Intelligence
B.Tech. IV Year – (Sem-8) Mechanical Engineering
Type of course: Programme Core

Prerequisite: N.A.

Rationale: This subject is useful to understand concepts and techniques in robot manipulator Kinematics, enough to evaluate, chose, and incorporate robots in engineering systems. Familiarize with applications of Group Technology, Flexible manufacturing techniques, Materials Requirement Planning and Manufacturing Resource planning to solve manufacturing and other industry related problems.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	T	P		Theory Marks		Practical Marks				
			ESE (E)	PA (M)	PA (V)		PA (I)			
					ESE	OEP	PA	RP		
4	2	0	5	70	30	30	0	20	0	150

Content:

Sr. No.	Content	Total Hrs.	% Weightage
1.	Artificial Intelligence: Definition of AI, Learning AI techniques, problems and Problems space, AI characteristics, Heuristics. Problem solving Methods: Forward and backward reasoning, problem trees, problem graph, hill climbing, search method, problem reduction, constraint satisfaction, means and analysis, game playing, mini max algorithms, alphabetic heuristics.	10	20
2.	Computer Vision: Perception, early processing, representation and recognition of scenes, Guzman's algorithms of spurting objects in a scene, Waltz algorithm.	8	18
3.	Neural Language : Understanding problems, syntactic analysis, semantic analysis, augmented transition networks.	6	12
4.	Knowledge representation (Logic): Representing facts in logic predicate logic, resolution, unification, question answering, mathematical theorem proving. Knowledge representation (Structured): Declarative representation, Semantic nets, procedural representation.	10	20
5.	Learning: Learning as induction, Failure drive learning, Learning by teaching, Learning with the use of examples (Winston's program) skill acquisition.	8	18
6	Case study on Application of AI in Mechanical Engineering	6	12

Suggested Specification table with Marks (Theory):

Remembrance	Understanding	Apply	Analyze	Evaluate
20	20	10	10	10

Reference Book:

1. Elaine Rich, Artificial Intelligence, Mc Graw Hill, 1985.
2. Nilson, Principles of Artificial Intelligence.
3. Robotics and Artificial Intelligence” by Michael Brady
4. Computational Intelligence, Control and Computer Vision in Robotics and Automation by Bidyadhar Subudhi
5. Assistive Technology and Artificial Intelligence: Applications in Robotics, User Interfaces and Natural Language Processing (Lecture Notes in Computer Science) by Vibhu O Mittal

Course Outcome:

1. Students will be able to understand the basic AI techniques applicable in Mechanical Engineering
2. Students will learn Neural Network and Computer vision fundamentals and applications
3. Students will understand application of Machine learning in automation of machine tools and factories