GUJARAT TECHNOLOGICAL UNIVERSITY

MECHANICAL (PRODUCTION ENGINEERING) (28)
ARTIFICIAL INTELLIGENCE IN MANUFACTURING
SUBJECT CODE: 2742802
M.E. 4TH SEMESTER

Type of course: Major Elective - V

Prerequisite: NIL

Rationale: This course provides the knowledge of Expert Systems and Artificial Intelligence in manufacturing. This course gives hands on practice regarding development of Older Manufacturing Unit renovating Intelligent Automation like Metal cutting, Metal Welding and forming of different sheet metal components. This course gives knowledge about different major industrial application related to modernize Production.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
				Theory Marks		Practical Marks				
L	T	P	C	ESE (E)	PA (M)	ESE (V)		PA (I)		
						ESE	OEP	PA	RP	
3	2#	0	4	70	30	30	0	10	10	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	**Introduction:** AI is an exciting and rewarding discipline. Students can use AI to solve complex problems in CAD/CAM and Engineering.	4	12
2	**ITS ROOTS AND SCOPE:** Definitions, overview of AI application areas, AI as Representation and search: the predicate calculus, application	4	12
3	**STRUCTURES AND STRATEGIES FOR STATE SPACE SEARCH:** Introduction, Graph theory, Strategies for state space search using the state space to represent, Reasoning with the Predicate Calculus.	4	13
4	**HEURISTIC SEARCH:** algorithm, admissibility, informedness, using heuristic in Games and complexity issues.	4	12
5	**CONTROL AND IMPLEMENTATION OF STATE SPACE SEARCH:** Recursion based Search, Pattern-Directed search and production systems.	4	12
6	**MACHINE LEARNING:** Symbol based, connectionist, social and emigrant	4	12
7	**ADVANCED TOPICS:** AI Problem Solving: Automated reasoning and Understanding natural language.	4	12
8	**RECENT DEVELOPMENT:** Knowledge based systems, Expert Systems and AI in manufacturing as case studies published in research papers.	4	13

Reference Books:

1. Artificial Intelligence- Structures and Strategies for Complex Problem Solving George F. Lugar- Pearson Education Asia.
2. Artificial Intelligence by Elaine Rich & Kevin Knight, Tata McGraw Hills.
3. Introduction to Artificial Intelligence by Dan W. Petterson, PHI Publishers

Course Outcome:
This course gives knowledge about different major industrial application related to modernize Production.

Major Equipments:

1. Intelligent Robots
2. MATLAB
3. C++

List of Open Source Software/learning website:

1. http://www.nptel.ac.in/courses/106105077/

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.