SCHEME OF COURSE WORK

Course Details:

Course Title	: ARTIFICIAL INTELLIGENCE IN MANUFACTURING
Course Code	: 13ME2103 **L T P C** : 4 0 0 3
Program:	: M.Tech.
Specialization:	: CAD-CAM
Semester	: I
Prerequisites	: ROBOTICS
Courses to which it is a prerequisite	: INTELLIGENT MANUFACTURING SYSTEMS

Course Outcomes (COs):

At the end of the course, the student will be able to

1.	explain importance of artificial intelligence techniques used in expert system software.
2.	estimate the difference between forward and backward chaining inference strategies.
3.	show the linking of expert systems to other software such as DBMS, MIS, MDB.
4.	explain the difference between fault diagnosis and failure analysis.
5.	solve the case studies of typical applications in solving manufacturing problems like process selection, tool selection, etc.

Program Outcomes (POs)

At the end of the program, the students in CAD/CAM will be able to
1. acquire fundamentals in the areas of computer aided design and manufacturing
2. apply innovative skills and analyze computer aided design and manufacturing problems critically
3. identify, formulate and solve design and manufacturing problems
4. carry out research related to design and manufacturing
5. use existing and recent CAD/CAM software
6. collaborate with educational institutions, industry and R&D organizations in multidisciplinary teams
7. apply project and finance management principles in engineering projects
8. prepare technical reports and communicate effectively
9. engage in independent and life-long learning and pursue professional practice in their specialized areas of CAD/CAM
10. exhibit accountability to society while adhering to ethical practices
11. act independently and take corrective measures where necessary

Course Outcome versus Program Outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO-1	S	S		S	M	M	S				
CO-2	S	M	M	M	M				M		
CO-3	S	M	M	M	S		M	M			M
CO-4	S	S	M		S						
CO-5	S	M	M		S	S		M	M	M	S

S - Strongly correlated, *M - Moderately* correlated, *Blank - No correlation*

Assessment Methods:	Assignment / Quiz / Seminar / Case Study / Mid-Test / End Exam

Teaching-Learning and Evaluation

Week	TOPIC / CONTENTS	Course Outcomes	Sample questions	TEACHING-LEARNING STRATEGY	Assessment Method & Schedule
1	Artificial intelligence - definition - components - scope - application areas	CO - 1	Explain the scope and importance of Artificial Intelligence	▫ Lecture ▫ Demonstration	
2	Knowledge - based systems (expert systems) - definition – justification.	CO - 1	Define expert system and justify its role in artificial intelligence	▫ Lecture ▫ Discussion	
3	Knowledge - based systems (expert systems) - structure – characterization.	CO - 1	Discuss in brief about the structure of expert system	▫ Lecture ▫ Discussion ▫ Problem solving	
4	Knowledge sources - expert - knowledge acquisition	CO - 1	What is meant by knowledge acquisition	▫ Lecture ▫ Discussion	
5	Knowledge representation - knowledge base - interference strategies	CO - 2	Explain the concept of interference strategy	▫ Lecture ▫ Discussion	
6	Interference strategies - forward and backward chaining.	CO - 2	Explain the types of interference strategies	▫ Lecture ▫ Discussion	
7	Expert system languages – Expert system building tools or shells.	CO - 2	Discuss about expert system languages	▫ Lecture ▫ Discussion	Case Study -1 (Week 7)
8	Expert system shell	CO - 3	Define an expert system shell	▫ Lecture ▫ Discussion	Seminar - 1 (Week 8)
9	Mid-Test 1				Mid-Test 1 (Week 9)
10	Typical examples of shells	CO - 3	Name some examples of expert system building tools	▫ Lecture ▫ Discussion	
11	Expert system software for manufacturing applications in CAD, CAPP, MRP , adaptive control	CO - 3	Discuss in brief about CAD, CAPP, MRP , adaptive control systems	▫ Lecture ▫ Discussion	
12	Process selection, Group Technology etc. linking expert systems to other software such as DBMS, MIS, MDB.	CO - 3	Explain the concept of Group Technology Explain the concepts of DBMS, MIS, MDB	▫ Lecture ▫ Discussion ▫ Problem solving	
13	Robotics and process control	CO - 4	What do you mean by process control in expert system	▫ Lecture	
14	Fault diagnosis, failure analysis	CO - 4	What do you meant by fault diagnosis and failure analysis	▫ Lecture ▫ Discussion	
15	Process control and office automation	CO - 4	What do you meant by Process control and office automation	▫ Lecture ▫ Discussion	
16	Case studies of typical applications in tool selection, Process selection, Part classification	CO - 5	Discuss about Process selection and Part classification	▫ Lecture ▫ Discussion	Case Study -2 (Week 16)
17	Case studies of typical applications in Inventory control, Process planning.	CO - 5	Discuss about Inventory control and process planning	▫ Lecture ▫ Discussion	Seminar - 2 (Week 17)
18	Mid-Test 2				Mid-Test 2 (Week 18)
19/20	END EXAM				END EXAM