

II B. Tech – II Semester

(20ME4638) INTELLIGENT INDUSTRIAL SYSTEMS

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	1	-	4

Pre-Requisites: Basics of CAD/CAM

Course Objectives:

The Students will acquire the knowledge:

- To interpret the Computer integrated manufacturing systems – structure and functional areas.
- To discuss the Components of knowledge based systems.
- To outline the concepts of Automated process planning.
- To discuss about Group technology: models and algorithms.
- To outline the Knowledge based group technology.

UNIT-I: Computer Integrated Manufacturing Systems:

Structure and functional areas of CIM system - AD, CAPP, CAM, CAQC, ASRS and advantages of CIM Manufacturing communication systems – MAP/TOP OSI model, data redundancy, top-down and bottom-up approach, volume of information. Intelligent manufacturing – system components, system architecture and data flow, system operation.

UNIT-II: Components of Knowledge Based Systems

Basic components of knowledge based systems, knowledge representation, comparison of knowledge representation schemes, inference engine, knowledge acquisition Machine learning – concept of artificial intelligence, conceptual learning, artificial neural networks -biological neuron, artificial neuron, types of neural networks, applications in manufacturing

UNIT-III: Automated Process Planning

Variant approach, generative approach, expert systems for process planning, feature recognition, phases of process planning Knowledge Based System for Equipment Selection (KBSES) – Manufacturing system design, equipment selection problem, modelling the manufacturing equipment selection problem, problem solving approach in KBSES, structure of the KBSES

UNIT-IV: Group Technology: Models and Algorithms

visual method, coding method, cluster analysis method, matrix formation – similarity coefficient method, sorting-based algorithms, bond energy algorithm, cost based method, cluster identification method, extended ci method.

UNIT-V: Knowledge Based Group Technology

Group technology in automated manufacturing system, structure of knowledge based system for group technology (KBSGT) – data base, knowledge base, clustering algorithm.

Course Outcomes:

A student who successfully fulfills this course requirement will be able to:

S. No	Course Outcome	BTL
1.	Illustrate the concepts of Computer integrated manufacturing systems – structure and Functional areas.	L2
2.	Explain the Components of knowledge based systems.	L2
3.	Summarize the concepts of Automated process planning.	L3
4.	Describe the theory of Group technology: models and algorithms.	L3
5.	Outline the concepts of Knowledge based group technology.	L3

Correlation of Cos with POs & PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	1	3	3	1	1	1	1	1	2	2
CO2	3	3	2	2	1	2	1	0	3	2	1	1	3	3
CO3	3	3	2	3	1	1	3	1	2	1	0	1	3	2
CO4	3	3	3	3	1	3	1	1	2	3	2	0	3	2
CO5	3	3	2	2	2	3	2	0	3	1	1	1	3	2

Text Books

1. Mikell P. Groover, “Automation, Production Systems and Computer Integrated Manufacturing”, 8th edition, PHI, 2008.
2. YagnaNarayana, “Artificial Neural Networks”, PHI, 2009.

References:

1. Andre Kusaic, “ Intelligent Manufacturing Systems”, PHI,1989
2. Hamid R. Parsaei and Mohammad Jamshidi, “Design and Implementation of Intelligent Manufacturing Systems”, PHI, 2009