II Year II Semester	**L**	**T**	**P**	**C**
Code: 20ME4638	**3**	**1**	**0**	**4**

INTELLIGENT INDUSTRIAL SYSTEMS

Course Objectives:

The Students will acquire the knowledge:

1. To interpret the Computer integrated manufacturing systems – structure and functional areas.
2. To discuss the Components of knowledge based systems.
3. To outline the concepts of Automated process planning.
4. To discuss about Group technology: models and algorithms.
5. 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, interference 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.

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

Course Outcomes:

Upon successful completion of this course, the students will be able to:

1. Illustrate the concepts of Computer integrated manufacturing systems – structure and Functional areas.
2. Explain the Components of knowledge based systems.
3. Summarize the concepts of Automated process planning.
4. Describe the theory of Group technology: models and algorithms.