III B. Tech – II Semester

(20ME6766) TOOL AND PART PROBING INTEGRATION

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

Pre-Requisites: Machine tools, CAD/CAM

Course Objectives:

- Emphasizes the integration of manufacturing enterprise using computer-integrated manufacturing (CIM) technologies. It employs CAD/CAM interface and other CIM subsystems, database management, facility layout, Group technology, teamwork, and manufacturing operations.

UNIT-I:

Introduction to Manufacturing systems: CIM Technology, CIM models, FMS Concepts Definition of FMS – types of FMS, types of flexibility and performance measures, Different FMS layouts, advantages, disadvantages, components of FMS, manufacturing cell. Group technology-classification and coding, production flow analysis, machine cell designsimple examples in design, Machining centers and turning centers, handling systems, loading and unloading-fixtures and pallets,head indexers

UNIT-II:

Distributed numerical control: DNC system – communication between DNC computer and machine control unit – hierarchical processing of data in DNC system – features of DNC system. Adaptive control in Machine control unit. Networking concepts, LOSI, MAP, TOP, LAN, WAN, Communication interface, bus architecture, topologies, and protocols Manufacturing data base.

UNIT-III:

Automated material handling: Function, types, analysis of material handling equipments. Design of AGV systems.

UNIT-IV:

Automated storage: Storage system performance, AS/RS, carousel storage system,WIP storage, Analysis of AS/RS, Industrial robots. Tool Management system-tool strategies-tool identification technologies and tool monitoring, Inspection stations.

UNIT-V

Development and implementation of FMS: Planning phases, scheduling, integration, system configuration, simulation, FMS project development steps. Hardware and software development. Installation and implementation. Application and benefits of FMS, Quantitative analysis of FMS. Typical Case studies.

Course Outcomes:

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

S. No	Course Outcome	BTL
1.	Explain the fundamental principles of CIM Technology, CIM models and FMS concepts.	L2
2.	Illustrate Distributed numerical control.	L2
3.	Outline Automated material handling.	L2
4.	Classify Automated storage.	L2
5.	Summarize Development and implementation of FMS.	L2

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

References:

1. Parrish D. J, "Flexible manufacturing", Butterworth – Heinemann Ltd, 1990
2. Groover M. P, "Automation, production systems and computer integrated manufacturing", Prentice Hall India (P) Ltd., 2002
3. Shivanand H. K., Benal M. M and Koti V, "Flexible manufacturing system", New AgeInternational (P) Limited.Publishers, 2006
4. Kusiak A., "Intelligent manufacturing systems", Prentice Hall, Englewood Cliffs,NJ,1990
5. Considine D. M. &Considine G. D, "Standard handbook of industrial automation", Chapman and Hall, London, 1986
6. Ranky P. G, "The design and operation of FMS", IFS Pub, U. K, 1998
7. Joseph Talavage&Hannam, "Flexible Manufacturing Systems in Practice", Marcel Dekker Inc.
8. Kant Vajpayee, "Principles of Computer Integrated Manufacturing", Prentice Hall of India.