4/4 B.Tech. EIGHTH SEMESTER

ME8T2D FLEXIBLE MANUFACTURING SYSTEMS & GROUP TECHNOLOGY Credits: 4

Lecture:- 4 periods/week **Internal assessment: 30marks**
Tutorial: -- **Semester end examination: 70 marks**

Objectives:

1. Demonstrate the components and need of FMS in modern manufacturing
2. Get the knowledge of applying FMS in industries
3. Classify the parts according coding system
4. Get the skill of modeling and design for critical systems

Learning outcomes:

At the end of course the students will be able to:

1. Describe the Structure of FMS and workstation for inspection
2. Explain the concepts of advanced material handling storage system
3. Analyze the various levels of FMS control systems
4. Describe different types of coding system in Group technology (GT)
5. Identify applications of GT in different complex systems

Prerequisites:
CAD/CAM

UNIT – I
INTRODUCTION:
Manufacturing Automation, Need of flexibility, Concept of flexibility, Definition and types of FMS, Architecture of FMS, Work piece flow in FMS, Performance measures of FMS.**WORK STATION:** CNC Machines, Machine Centers, Inspection Stations

UNIT – II
AUTOMATED MATERIAL HANDLING:
Function of MHS, Types of Material handling equipment, Conveyor systems, AGVs, Industrial Robots.
AUTOMATED STORAGE SYSTEMS: Characteristics of Storage Systems.

UNIT – III

AUTOMATED INSPECTION SYSTEMS:

In-process gauging, Coordinate measuring Machines – principle, construction, types of structure and their applications; Probes – various shapes, sizes and applications, operation and programming of CMMs

UNIT – IV

COMPUTER CONTROL SYSTEM OF FMS:

Functions of Computer, Control system architecture, Factory level, Cell level control systems, Equipment control systems, Factory communications, Local area networks, Data files and system reports.

UNIT-V

FMS PLANNING:

short term planning problems, Loading models in FMS, Production planning model for an FMS, FMS control, FMS planning and control,

UNIT -VI

GROUP TECHNOLOGY:

Introduction, part families ,need of G.T. Part families, Methods for developing part families

UNIT-VII

BASIC TYPE OF CODES :

Hierarchical codes, Attribute code, Hybrid code, selecting a coding system, Developing a coding system in an industry, examples of coding systems, MICLASS, OPITZ, CODE systems.

UNIT-VIII

FACILITY DESIGN USING GT:

Introduction , economic modeling in GT environment – production planning cost model, Economics of GT, Application of GT for design retrieval, CAPP, NIC, MR and FMS.

Learning resources

Text book:

1. Automation & Production Systems and Computer Integrated Manufacturing, by M.P.Groover, Prentice Hall,2007

Reference books:

1. Performance Modeling of Automated Manufacturing Systems, by N.Viswanadham, Y.Narahari, Prentice Hall,1992.
2. CAD/CAM Handbook, by Eric Teichloz ,McGraw-Hill,1985.
3. Computer Integrated Design and Manufacturing, Bedworth Henderson,, McGraw- Hill,1991.