IV B.TECH - II SEMESTER

FLEXIBLE MANUFACTURING SYSTEMS & GROUP TECHNOLOGY

Course Code: ME8T2D **Credits: 3**
Lecture: 3 periods/week **Internal assessment: 30 marks**
Tutorial: 1 period/week **Semester end examination: 70 marks**

COURSE OBJECTIVES:

- Demonstrate the components and need of FMS in modern manufacturing
- Get the knowledge of applying FMS in industries
- Classify the partsac cording coding system
- Get the skill of odeling and design for critical systems

COURSE OUTCOMES:

Upon completion of this course the student will be able to:

1. Describe the Structure of FMS and types of workstations.
2. Analyze the various levels of FMS, planning and control.
3. Explain the concepts of material handling, storage and automated inspection systems.
4. Describe part families, different types of coding system sin 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

COMPUTER CONTROL SYSTEM OFFMS:

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.

FMS PLANNING: short term planning problems, loading models in FMS, Production planning model for an FMS, FMS control, FMS planning and control.

UNIT III

AUTOMATED MATERIAL HANDLING STORAGE SYSTEMS:

Function of MHS, Types of Material handling equipment, Conveyor systems, AGVs, Industrial Robots. Characteristics of Storage Systems Automated storage and retrieval systems; work in process storage, inter facing and ling and storage with manufacturing.

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
GROUP TECHNOLOGY:
Introduction, part families, need of G.T. Part families, Methods for developing part families
BASIC TYPE OF CODES:
Hierarchical codes, Attri but ecode, Hybrid code, selecting acoding system, Developing acoding system in an industry, examples of coding systems, MICLASS,OPITZ,CODE systems.

UNIT V
FACILITY DESIGN USING GT:
Introduction, economic modelling in GT environment–production planning cost model, Economics of GT, Application of GT for design retrieval, CAPP, and FMS.

Learning Resources

Text Books:

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, byEric Teichloz ,McGraw-Hill,1985.
3. Computer Integrated Design and Manufacturing, Bedworth Henderson,, McGraw- Hill,1991.