FLEXIBLE MANUFACTURING SYSTEM

Subject Code: 13ME2116

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Pre requisites: Automation in Manufacturing

Course Educational Objectives:

To make the student understand

1. automation strategies used in flexible manufacturing system (FMS)
2. computer control and software used in modern manufacturing systems
3. group technology and FMS planning
4. components of FMS and support equipments used

Course Outcomes:

The student will be able to

1. explain the concept of modern automated manufacturing system
2. describe planning and scheduling methods used in manufacturing systems
3. suggest advanced material transport equipments
4. explain different types of co-ordinate measuring machines
5. identify the hierarchy of computers used in FMS
6. select suitable database and software required for FMS

UNIT-I

Types of production, production planning and control, manufacturing in a competitive environment, concept, automation of manufacturing process , numerical control, adaptive control, material handling and movement, industrial robots, flexible fixturing, design for assembly, disassembly and service. types of FMS, types of FMS layouts, advantages and disadvantages of FMS

Group technology – composite part families - classification and coding - production flow analysis,

UNIT-II

Planning issues: components of FMS, types of flexibility, tradeoffs, computer control and functions, planning, scheduling and control of FMS, scheduling and knowledge-based scheduling.

Hierarchy of computer control, supervisory computer, introduction to turning center, machining center, cleaning and deburring equipment, coordinate measuring machines: types, working and capabilities.

UNIT-III

System support equipment, types, working capability, automated material movement and automated storage and retrieval systems, scheduling of AGVs, cutting tools and tool management, work holding considerations

FMS computer hardware and software, general structure and requirements, PLCs, FMS installation and implementation, acceptance testing

UNIT-IV

Computer software, simulation and database of FMS: System issues, types of software, specification and selection, trends, application of simulation, software, manufacturing data systems, data flow, CAD/CAM considerations, planning FMS database

UNIT-V

Characteristics of JIT pull method, small lot sizes, work station loads, flexible work force, line flow strategy. supply chain management

Preventive maintenance - Kanban system, value engineering, MRD JIT, lean manufacture, quality concepts and management

TEXT BOOK:

1. Shivanand H.K., Benal MM, Koti V, "*Flexible Manufacturing System*", New age international (P) Limited, New Delhi, 2006

REFERENCES:

1. Mikell P. Groover "*Automation, Production Systems and Computer Integrated Manufacturing*", PHI, 2008.

2. Kalpakjin, "*Manufacturing Engineering and Technology* ", Addison-Wesley Publishing Co., 1995.