

## **FLEXIBLE MANUFACTURING SYSTEM**

**Course Code: 15ME2115**

**L P C**  
**3 0 3**

**Course Outcomes:** At the end of the course, the student will be able to

**CO1:** Apply the concepts of PPC and GT to the development of FMS.

**CO2:** Discuss the planning and scheduling methods used in manufacturing systems.

**CO3:** Identify various workstations, system support equipments.

**CO4:** Identify hardware and software components of FMS.

**CO5:** Summarize the concepts of modern manufacturing such as JIT, supply chain management and lean manufacturing etc.

### **UNIT-I** (10-Lectures)

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** (10-Lectures)

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** (10-Lectures)

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

**UNIT-IV** (10-Lectures)

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

**UNIT-V** (10-Lectures)

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.