IV B.TECH - II SEMESTER
AUTOMATION IN MANUFACTURING

Course Code: ME8T2B	**Credits: 3**
Lecture: 3 periods/week	**Internal assessment: 30 marks**
Tutorial: 1 period/week	**Semester end examination: 70 marks**

COURSE OBJECTIVES:

- Describe the basic concepts of automation in manufacturing systems.
- Acquire the fundamental concepts of automated flow lines and their analysis.
- Classify automated material handling, automated storage and retrieval systems.
- Illustrate adaptive control systems and automated inspection methods.

Course Outcomes:

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

1. Illustrate the basic concepts of automation in machine tools.
2. Analyze various automated flow lines, Explain assembly systems and line balancing methods.
3. Describe the importance of automated material handling and storage systems.
4. Interpret the importance of adaptive control systems, automated inspection systems.

Pre-Requisites: Machine Tools, Cad/ Cam

UNIT I
INTRODUCTION- Single-Station Manufacturing Cells, types and strategies of automation, Automation in machine tools, automation principles, Mechanical feeding and tool changing, machine tool control, elements in product realization.
AUTOMATED FLOW LINES:
Methods of work part transport, transfer mechanisms, buffer storage, control function, Design and fabrication consideration.

UNITII:
ANALYSIS OFAUTOMATED FLOW INES
General terminology, analysis of transfer lines with and without buffer storage, partial automation, implementation of automated flow lines.
ASSEMBLY SYSTEMS AND LINEBALANCING:
Assembly process, Manual Assembly Lines, Line balancing methods, ways for improving line balance, flexible assembly lines.

UNITIII:
AUTOMAT EDMATERIAL HANDLING:
Types of equipment, functions, analysis and design of material handling systems conveyor systems, automated guided vehicle systems.
AUTOMATED STORAGE SYSTEMS: Automated storage and retrieval systems work in process storage, inter facing and ling and storage with manufacturing.

UNITIV

ADAPTIVE CONTROL SYSTEMS:

Introduction – Adaptive control with optimization, Adaptive control with constraints, Application of Adaptive control in Machining operations. Uses of various parameters such as cutting force, Temperature, vibration and acoustic emission Adaptive control.

UNITV

AUTOMATED INSPECTION: Fundamentals, types of inspection methods and equipment, CMM, Types, methods of CMM control, Machine vision- Introduction, image acquisition, and image processing applications of machine vision.

Learning Resources

Text Book:

1. Automation, Production Systems and Computer Integrated Manufacturing: M.P. Groover./PE/PHI

2. Computer Control of Manufacturing Systems: Yoram Coren.

Reference Books:

1. CAD/CAM/CIM, (2nd Edition),by Radhakrishnan and Subramanian, NewAge Publications,
2. CAD / CAM/ CIM by Radhakrishnan.
3. Automation by W. Buekinsham.