

AMIE13 MANUFACTURING AUTOMATION

UNIT-1 INTRODUCTION

- 1.1 Automation in Production System, Principles and Strategies of Automation,
- 1.2 Basic Elements of an Automated System, Advanced Automation Functions,
- 1.3 Levels of Automations, introduction to automation productivity.

UNIT-2 MATERIAL HANDLING SYSTEMS

- 2.1 Overview of Material Handling Systems- Rotary feeders, oscillating force feeder, vibratory feeder, elevator type and Centrifugal type feeders,
- 2.2 Principles and Design Consideration, Material Transport Systems, Storage Systems.

UNIT-3 AUTOMATED MANUFACTURING SYSTEMS:

- 3.1 Components, Classification and Overview of Manufacturing Systems, Manufacturing Cells,
- 3.2 GT and Cellular Manufacturing, FMS, FMS and its Planning and Implementation,
- 3.3 Flow lines & Transfer Mechanisms, Fundamentals and Analysis of Transfer Lines, product design for automatic assembly.

UNIT-4 CONTROL TECHNOLOGIES IN AUTOMATION

- 4.1 Industrial Control Systems, Process Industries Verses Discrete-Manufacturing Industries, Continuous Verses Discrete Control,
- 4.2 Computer Process and its Forms. Sensors, Actuators and other Control System Components.

UNIT-5 EVALUATION OF AUTOMATIC PRODUCTION:

- 5.1 Product manufacturability, orientation devices- active and passive devices, parts orientation and Rocationment.

UNIT-6 PNEUMATIC AND HYDRAULIC COMPONENTS AND CIRCUITS:

- 6.1 Boolean algebra, pneumatic sensors and amplifiers, jet destruction devices, logic devices,
- 6.2 Schimit triggering devices, developing pneumatic circuits for automatic die casting machine.

UNIT-7 MODELING AND SIMULATION FOR MANUFACTURING PLANT AUTOMATION:

- 7.1 Introduction, need for system Modeling,
- 7.2 Building Mathematical Model of a manufacturing Plant, Modern Tools-
- 7.3 Artificial neural networks in manufacturing automation, AI in manufacturing,
- 7.4 Fuzzy decision and control, robots and application of robots for automation.

Reference Books:

1. Handbook of design, manufacturing & Automation : R.C. Dorf, John Wiley and Sons.
2. Automation, Production Systems and Computer Integrated Manufacturing, M.P. Groover, Pearson Education.
3. Industrial Automation : W.P. David, John Wiley and Sons.