ROBOTICS   (3 – 1 – 0 : 4)

1. INTRODUICTION: Definition of a robot, Difference between hard automation and robotic automation, Characteristics of a robot .Need for robots and their benefits, economic aspects in robot applications. Robot classification and their application, Robot generations.

2. ROBOT IN WORK PLACE: Need for interfacing, part feeding, magazines, and Orienting devices. Special fixtures conveyor belts, Overhead transport, Work cell organization in robotic environment, Work cell design and control.

3. REPRESENTATION OF A ROBOT: Fundamental and graphical representation of Robots, Arm structures in use , structure to end effectors , Degrees of freedom of a rigid of body, degrees of a robot ,Degree of freedom and mobility.

4. ROBOT TECHNOLOGY: Robot anatomy and units ,work volume, Element and type of drive and control systems, precision of movement, Actuators , power transmission systems, Manipulator kinematics and path control, configuration of robot controller.

5. TYPES OF GRIPPERS: Mechanical grippers, consideration in gripper selection and design.

6. SENSORS AND VISION: Tactile, proximity and range sensors in robot ,Velocity sensors, Robot Vision, Introduction to motion planning and image processing.

7. METHOD OF ROBOT PROGRAMMING: Robot programming languages, introduction to intelligent Robots.

8. ROBOT APPLICATIONS IN INDUSTARIES: Material handling and processing, metal cutting processing, welding, spray coatings, inspection, Assembly and Hazardous operating conditions, safety in robot, social and labor issues in robotics. Material handling using AGVs automated storages system using mobile robots, Issues in implementation of robotics in industry.

Total number of periods: 45

Recommended books:

1. *Groover,weiss,Nagel and Odrey, Industrial Robotics:Technology, programming and Application,McGraw Hill,New York.*
2. *Lee , Fu and Gangalase, Robotics: Scontrol, sensing , vision, and intelligence, McGraw Hill,New York.*
3. *Robert J.Schilling , fundamental of Robotics Analysis and control, prentice Hall India ,New Delhi.*
4. *Klafter, chmielewski and negui, Robotic engineering :An integrated approach prentice Hall India ,New Delhi.*
5. *Y.Koren, Robotics for engineers , McGraw Hill,New York*
6. *J.J.Craig ,Introduction to Robotics , Addison- Wesley publishing company.*
7. *S.R>Deb Robotics and Flexible Automation, Tata McGraw Hill,New York.*
8. *William. C. BVurns Jr and Janet Evens werthington, practical robotics – systems,interfacing and applications, prentice Hall,New Jersy*
9. *Coiffet and chirouze, introduction to Robot Technology, McGraw Hill,New York*
10. *Heath. L. Reston, Fundamentals of robotics : Theory and applications, Reston Prentice Hall, Virginia.*
11. *Bernard Hodges, Industrial Robotics, Jaic publishing house, Bombay*