MH2701
ROBOTICS AND MACHINE VISION SYSTEMS

INTRODUCTION

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GOAL:

To introduce the hardware and programming concepts of industrial robots and their applications.
OBJECTIVES:

- Learn the concepts of robot kinematics.
- Learn the principles of robot drives and controls.
- Learn the sensors used in robots.
- Learn the robot cell design.
- Learn the concepts of expert systems.
OUTCOME:

- Understand the kinematics of robots and adaptive control.
- Understand the robot actuators and controls.
- Get knowledge in sensors and selection of sensors for specific need.
- Get knowledge in robot cell layouts and their applications.
- Get knowledge in robot programming and artificial intelligence and machine vision.
UNIT1 - DRIVES AND CONTROLS:


UNIT2 – KINEMATICS OF ROBOT:

Kinematics of Robot: Introduction, Matrix Representation, Homogeneous transformation, forward and inverse Kinematics, Inverse Kinematics Programming, Degeneracy, dexterity, velocity and static forces, velocity transformation force control systems, Basics of Trajectory planning.
UNIT3 – GRIPPERS AND SENSORS:


Sensors: Position sensors – Potentiometers, encoders – LVDT, Velocity sensors, Acceleration

Sensors, Force, Pressure and Torque sensors, Touch and Tactile sensors, Proximity, Range and sniff sensors, RCC, VOICE recognition and synthesizers.
UNIT4 – MACHINE VISION:

Introduction – Image processing Vs image analysis, image Acquisition, digital Images – Sampling and Quantization – Image definition, levels of Computation.

UNIT5 – IMAGE PROCESSING:

TEXTBOOK:


REFERENCES:


ASSESSMENT PLAN:
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THANK YOU