

AMPR25 ROBOTICS

UNIT-1 BASICS OF ROBOTICS

- 1.1 Introduction- Basic components of robot-Laws of robotics- classification of robot-work space accuracy- resolution repeatability of robot.
- 1.2 Power transmission system: Rotary to rotary motion, Rotary to linear motion, Harmonics drives

UNIT-2 ROBOT END EFFECTORS

- 2.1 Robot End effectors: Introduction- types of End effectors
- 2.2 Mechanical gripper- types of gripper mechanism
- 2.3 Gripper force analysis- other types of gripper- special purpose grippers.

UNIT-3 ROBOT MECHANICS

- 3.1 Robot kinematics: Introduction- Matrix representation- rigid motion & homogeneous transformation forward & inverse kinematics- trajectory planning.
- 3.2 Robot Dynamics: Introduction- Manipulator dynamics- Lagrange- Euler formulation- Newton- Euler formulation

UNIT-4 MACHINE VISION FUNDAMENTALS

- 4.1 Machine vision: image acquisition, digital images-sampling and quantization
- 4.2 Levels of computation Feature extraction-windowing technique- segmentation
- 4.3 Thresholding- edge detection- binary morphology- grey morphology

UNIT-5 ROBOT PROGRAMMING

- 5.1 Robot programming: Robot Languages-
- 5.2 Classification of robot language-Computer control and robot software
- 5.3 Val system and Languages- application of robots.

References Books:

1. Sathya Ranjan Deb, "Robotics Technology & flexible Automation" Sixth edition, Tata McGraw-Hill Publication, 2003.
2. K.S.Fu, R.C.Gonzalez, C.S.G.Lee, "Robotics: Sensing, Vision & Intelligence", Tata McGraw-Hill Publication, 1987.
3. John.J.Craig, "Introduction to Robotics: Mechanics & control", Second edition, 2002.