

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. Mechatronics (Branch Code - 47)

Year – II (Semester – III) (W.E.F. July 2013)

Subject: Robotic Engineering (734702)

Sr. No.	Content	Hours
1	General considerations of Robotic Manipulator History of robot; Geometric configurations, work volumes and Degree of freedoms; Types of drives systems; Analysis of Robotic inaccuracies and resolutions.	08
2	Kinematics of Robotic Manipulator Service Index of different configurations; Homogeneous transformation; Direct Kinematic; Inverse Kinematics; D-H representation.	13
3	Forces in Manipulators Statics and dynamics; considerations of forces, moments and torques for various basic robotic configurations; Counter balancing systems	13
4	Robotic Sensing Assembly Sensors: RCC, force and torque sensors; proximity, range and tactile sensors; some special purpose sensors.	10
5	Trajectory Generation Cubic polynomials; Higher order polynomials; Linear function with parabolic blends; numerical based on different motion trajectories.	06
6	Critical design components Introduction to various important design components used in Robotics	06
	Total number of hours	56

Reference Books:

1. A Robot Engineering Textbook
Mohsen Shahinpoor, Harper and Row, Publisher, New York
2. Mechanical Design of Robots
Eugene I. Rivin, McGraw Hill Book Company, New York
3. Introduction to Robotics: Analysis, Control, Applications
Saeed Niku, John Wiley & Sons
4. Industrial Robotics: Technology, Programming and Applications
M.P. Groover, TATA Mc-Graw Hill