

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E Semester: 4

MECHATRONICS ENGINEERING

Subject Name: BASIC MECHATRONICS(Institute Elective-I)

Sr. No.	Course content
1.	Mechatronics Introduction, Systems, Measurement systems, Control systems, Microprocessor based controllers, Applications
2.	Sensors and transducers Terminology, Displacement, position and proximity, velocity and motion, force, fluid pressure, liquid flow, liquid level, temperature, Light sensor, inductive transducers, piezo-electric transducers, hall effect transducers, light emitting diode, strain gauge, load cell, fiber optic transducers.
3.	Pneumatic and Hydraulic actuation systems Actuation systems, pneumatic and hydraulic systems, pumps, directional control valves, pressure control valves, flow control valves, cylinders, pneumatic and hydraulic circuits
4.	Mechanical actuation systems Mechanical systems, types of motion, Kinetin chains, cams, gear trains, belt and chain drives, bearings, mechanical aspects of motor selection.
5.	Introduction to CNC machines & robotics NC-CNC-DNC machines, structure, slideways, guideways etc., components of robots, classification, application.
6.	Electrical actuation systems Electrical systems, mechanical switches, solid state switches, solenoids, D.C.motors, A.C.motors, Stepper motors
7.	Actuators modeling Direct current motors, stepper motors, hydraulic motors, piezo electric actuators, examples.

8.	Control of Electrical motors Electrical relays, representation of output devices, control of D.C. motor, A.C.motor, stepper motor, induction motor.
9.	Microprocessors Microprocessor systems, microcontroller, applications, programming.
10.	Design of mechatronics systems Introduction, Mechanical approach to design , examples, future trends.

REFERENCE BOOKS:

1. Mechatronics- Integrated mechanical electronics systems
K.P. Ramachandran, G.K. Vijayaraghavan, M.S. Balasundaram Wiley India Pvt Ltd, New Delhi.
2. Mechatronics-3rd edition
W.bolton,Pearson education Publication
- 3 Mechatronics ,N.P.Mahalik,Tata Mcgraw Hill
- 4 Mechatronics ,Dan Necsulescu,Pearson education
- 5 Mechatronics, HMT Ltd.,Tata Mcgraw Hill
- 6 A text book of mechatronics ,R.K.Rajput,S.chand