

7th Semester	REI7D003	Mechatronics	L-T-P 3-0-0	3 CREDITS
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MODULE-I**(10Hours)**

Evolution of Mechatronics, components of mechatronic system, types of mechatronic products, Signal theory, signal analysis and processing, Laplace transformation, Z-transformation modulation and de-modulation. Electrical components and electronic device –Resister, inductor and capacitor, reactance and impedance. Basic electronics devices junction diodes, Bipolar transistors

MODULE-II**(08Hours)**

Basic Digital Technology: Digital number system, Binary number system, Hexadecimal number system, Binary addition, Boolean Algebra, Logic function, Universal GATES, FLIP-FLOP, Registers counters. System modelling: Frequency response, Mechanical system, electrical system, Thermal system, Fluid system

MODULE-III**(10Hours)**

Actuators- Electric motors; D.C. Motors, Stepper motor, Hydraulic actuators, Pneumatic actuators Transducer and Sensors: Principles, difference between transducer and sensors, transducer types – photo emissive, photo conductive, photovoltaic, thermistors, Thermocouple, Inductive, capacitive, Peizoelectric, Hall effect transducers, Ionization transducer, Encoders- Incremental encoder, Optical encoder, Bimetallic strip, Strain gauge, load cell. Programmable Logic controller: Basic Structure - Programming: Ladder diagram Timers, Internal Relays and Counters - Shift Registers - Master and Jump Controls, data handling, Analog input / output, PLC Selection &Application. Microprocessor ad Microcontroller: Microprocessor based Digital control, registers, Program counter, Intel -8085 microprocessor

Books:

- [1] A Text Books of Mechatronics, R.K.Rajput, S.Chand & company
- [2] Mechatronics, N.G. P.C Mahalik, Tata McGraw Hill
- [3] Mechatronics, D.G. Alciator, M.B. Histan, Tata McGraw Hill
- [4] Mechatronics, A.Smaili & F Mrad, Oxford University Press
- [5] Mechatronics, K.P.ramchandran, G,K Vijay Raghavan, M. S Balachandran
- [6] Mechatronics An Intigrated approach, Clarence W de Sliva, CRC Press

Digital Learning Resources:

Course Name: Mechatronics
 Course Link: <https://nptel.ac.in/courses/112/107/112107298/>
 Course Instructor: Prof. Pushparaj Mani Pathak, IIT Roorkee