
IEME-024 : MECHATRONICS**L T P**
2 1 0**UNIT-I****INTRODUCTION TO MECHATRONICS & SEMICONDUCTOR DEVICES**

Historical perspective, key elements of mechatronics system.

Covalent bonds & doping material, PN junction, Zener diode, Tunnel diode, Schottky diode

Power Supplies & active component.

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UNIT-II**ANALOG & DIGITAL ELECTRONICS**

Number System, Minimization of Boolean expressions, Timing diagrams.

Combinational Logic Module : Adder, Subtractor, Multiplexer, Demultiplexer, Decoder & Encoder.

Sequential Logic Module : Flip flop (SR, JK, D, T & Master Slave), Counter (Synchronous)

Analog Electronics :Introduction to amplifier, Amplifier Basic Model, Different Amplifier (Inverting ,Noninverting, Summing, Integrator & Differentiator), Comparator, Sample hold circuit.

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UNIT-III**SENSORS & ACTUATORS**

Introduction to Sensor & different sensor (Distance, movement, time of flight, pressure measurement, temperature measurement & proximity sensor).

Actuators : Moving iron transducer, Solenoids, Servo motor, Kinematics chain, Gears, Cam mechanism, Different type of clutches.

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UNIT-IV**CONTROL THEORY & ROBOTIC SYSTEM**

Introduction to Control Theory, Modeling in frequency & time domain, Transfer function, System response, zero, first & second order.system, Routh Hurwitz Stability criterion, Root locus, Bode plot.

Types of robot, Robotic arm terminology, Robotic arm configuration, Robot system, Robotic manipulation kinematics, Robotic arm positioning concepts & Robotic arm path planning.

Introduction to reliability & reliability system.

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Text Book:

1. Godfrey Onwubolu, "Mechatronics : Principle & Application", India Reprint, Reed Elsewire India Private Limited, ISBN : 9788131205235.

References:

1. MAHALIK, "Mechatronics : Principles, Concepts And Applications", McGraw Hill Education Private Limited, 2009.
2. Ryszard Jablonsk, "Recent Advances In Mechatronic", Springer, 2008-2009.
3. Bolton, "Mechatronics : A Multidisciplinary Approach : Electronic Control Systems in Mechanical and Electrical Engineering", Pearson, 4 Edition, 2010.