

IAC - 211
Mechatronics

(02 credits – 50 marks)

Course Outcomes:

On completion of the course, students should be able to-

1	Define and Classify mechatronics system
2	Classify and Compare different types of Transducers.
3	Define various performance terminologies in Sensors.
4	Explain different types of actuators used in mechatronics
5	Analyze various types of sensors and selection procedure for various applications.
6	Design the real time application of Mechatronics based System.

Course Contents:

Module– I: Introduction

(06 Hrs)

Introduction to Mechatronics; Mechatronics Systems, Need for Mechatronics, Emerging area of Mechatronics, Classification of Mechatronics, Measurement Systems, Control Systems.

Module– II: Sensors and Transducers

(06 Hrs)

Performance Terminology in sensor technology; Potentiometers, LVDT, Capacitance sensors, Strain gauges, Eddy current sensor, Hall Effect sensor, Temperature sensors, Light sensors, Selection of sensors, Signal processing.

Module– III: Actuators

(06 hrs)

Actuators: Mechanical, Electrical, Fluid Power, Piezoelectric, Magnetostrictive, Shape memory alloy, applications, selection of actuators.

Module– IV: Design and Mechatronics Case Studies

(06 Hrs)

Stages in mechatronics system design, Traditional and Mechatronics design concepts, Case studies of Mechatronics systems - Pick and place Robot, Conveyor based material handling system, PC based CNC drilling machine, Mechatronics Control in Automated Manufacturing

Module-V:

Presentations, case studies, Assignments, Tutorials based on Module I to IV.

Ref. Books:

1. Bolton.W – Mechatronics - Pearson education, second edition, fifth Indian Reprint, 2003
2. Smaili.A and Mrad.F - Mechatronics integrated technologies for intelligent machines - Oxford university press, 2008.
3. Devadas Shetty and Richard A.Kolk, - Mechatronics systems design - PWS Publishing Company, 2007.
4. Godfrey C. Onwubolu - Mechatronics Principles and Applications - Elsevier, 2006.
5. Nitaigour Premchand Mahalik - Mechatronics Principles, Concepts and Applications - Tata
6. McGraw-Hill Publishing Company Limited, 2003.
7. Michael B.Histand and Davis G. Alciatore - Introduction to Mechatronics and Measurement
8. Systems - McGraw Hill International edition, 1999.
9. Bradley D.A, Dawson.D, Buru N.C and Loader A.J – Mechatronics - Nelson Thornes Ltd, Eswar press, Indian print, 2004.