

ME 645 Mechatronics (2-0-2-6)

Introduction: Definition of Mechatronics, Mechatronics in manufacturing, Products, and design. Comparison between Traditional and Mechatronics approach. Electronics: Review of fundamental of lectronics. Data conversion devices, sensors, microsensors, transducers, electrical contacts, actuators, and switches, contactless input devices, signal processing devices; relays, contactors, timers, output devices. Microprocessors and controllers. Drives: Stepper motors, servo drives. Mechanical: Ball screws, linear motion bearings, cams, systems controlled by camshafts, indexing mechanisms, hoppers, magazines, Chutes, transfer systems. Typical Mechatronics systems. Hydraulics: Hydraulic elements, walls, actuators, and various other elements. Hydraulic powder packs, pumps. Design of hydraulic circuits. Pneumatics: production, distribution and conditioning of compressed air. System components and graphic representations. Various types of controllers. Design and fabrication of Mechatronics systems.

Textsbooks:

- [1] HMT ltd. *Mechatronics*, Tata Mcgraw-Hill, New Delhi, 1988. ,
- [2] G.W. Kurtz, J.K. Schueller, P.W. Claar . II, *Machine design for mobile and industrial applications*, SAE, 1994..
- [3] T.O. Boucher, *Computer automation in manufacturing - an Introduction*, Chappman and Hall, 1996.
- [4] *Mechatronics*, Intl. J. published by Pergamon Press