

Introduction: Definition of mechatronics. Mechatronics in manufacturing, products and design. Review of fundamentals of electronics.

Mechatronics elements: Data conversion devices, sensors, microsensors, transducers, signal processing devices, relays, contactors and timers.

Processors /controllers: Microprocessors, microcontrollers, PID controllers and PLCs.

Drives: stepper motors, servo drives. Ball screws, linear motion bearings, cams, systems controlled by camshafts, electronic cams, indexing mechanisms, tool magazines, and transfer systems.

Hydraulic systems: flow, pressure and direction control valves, actuators, and supporting elements, hydraulic power packs, pumps. Design of hydraulic circuits.

Pneumatic system: production, distribution and conditioning of compressed air, system components and graphic representations, design of systems.

CNC technology and Robotics: CNC machines and part programming. Industrial Robotics.

Textbooks:

1. Boucher, T. O., Computer automation in manufacturing - an Introduction, Chapman and Hall, 1996.
2. HMT ltd. Mechatronics, Tata McGraw-Hill, New Delhi, 1988

References:

1. Deb, S. R., Robotics technology and flexible automation, Tata McGraw-Hill, New Delhi, 1994.
2. Boltan, W., Mechatronics: electronic control systems in mechanical and electrical engineering, Longman, Singapore, 1999.