

MEDICAL ELECTRONICS

Unit I: ACTION POTENTIAL AND TRANSDUCERS

Electrical activity in cells, tissues, muscles and nervous systems - transducers-types and characteristics-physiological transducers - pressure transducers - transducers for body temperature measurement - Pulse sensors-respiratory sensors.

Unit II: BIOSIGNAL ACQUISITION

Physiological signal amplifiers-isolation amplifiers-medical pre-amplifier design-bridge amplifiers-line driving amplifier-current amplifier – chopper amplifier-biosignal analysis - signal recovery and data acquisition-drift compensation in operational amplifiers-pattern recognition-physiological assist devices.

Unit III: BIOPOTENTIAL RECORDERS

Characteristics of recoding system - electro cardio graphy (ECG) – electro encephalo graphy (EEG) - electro myography (EMG) - electroetinography (ERG) - electroculography (EOG) – recorders with high accuracy –recorders for OFF line analysis.

Unit IV : SPECIALISED MEDICAL EQUIPMENTS:

Digital thermometer-audio meter –X-ray machines- radiography and flowscopy - angiography – elements of bio-telemetry system-design of bio-telemetry system-radio telemetry system-pace makers-lung machine-kidney machine.

Unit V: ADVANCED BIOMEDICAL INSTRUMENTATION

Computers in medicine - lasers in medicine – basic principles of endoscopes - nuclear imaging techniques - computer tomography (CT) Scanning – Ultrasonic imaging system-construction propagation and delay - magnetic resonance imaging (MRI).

TEXT BOOKS

1. Biomedical Instrumentation and Measurements-L. Cromwell, F.J. Weibell and E.A.Pfeiffer.
2. Biomedical Instrumentation- M. Arumugam-Anuradha Publications.
3. Handbook of Biomedical Instruments- R.S. Khandpur.