

AMEI-21 BIOMEDICAL INSTRUMENTATION

UNIT-1 BIOMEDICAL SIGNALS & PHYSIOLOGICAL TRANSDUCERS:

- 1.1 Source of biomedical signal, Origin of bioelectric signals, recording electrodes, Electrodes for ECG, EMG & EEG.
- 1.2 Physiological transducers: Pressure, Temperature, photoelectric & ultrasound Transducers.
- 1.3 Measurement in Respiratory system:
- 1.4 Physiology of respiratory system, Measurement of breathing mechanics Spiro meter, Respiratory therapy equipment's Inhalators ventilators & Respirators ,
- 1.5 Humidifiers, Nebulizers Aspirators, Biomedical recorders: ECG, EEG & EMG.

UNIT-2 PATIENT MONITORING SYSTEMS & AUDIOMETERS:

- 2.1 Cardiac monitor, Bedside patient monitor, measurement of heart rate, blood pressure, temperature, respiration rate, Arrhythmia monitor,
- 2.2 Methods of monitoring fetal heart rate, Monitoring labor activity.
- 2.3 Audiometers: Audiometers, Blood cell counters, Oximeter, Blood flow meter, cardiac output measurement, Blood gas analyzers.

UNIT-3 MODERN IMAGING SYSTEMS:

- 3.1 Introduction, Basic principle & Block diagram of x-ray machine, x- ray Computed Tomography (CT), Magnetic resonance imaging system (NMR), ultrasonic imaging system.
- 3.2 Eco-Cardiograph, Eco Encephalography, Ophthalmic scans, MRI. Therapeutic Equipments: Cardiac pacemakers, cardiac defibrillators,
- 3.3 Hemodialysis machine, Surgical diathermy machine.

UNIT-4 PATIENTS SAFETY & COMPUTER APPLICATIONS IN BIOMEDICAL FIELD

- 4.1 Precaution, safety codes for electro medical equipment, Electric safety analyzer, Testing of biomedical equipment, Use of microprocessors in medical instruments, Microcontrollers,
- 4.2 PC based medical instruments, Computerized Critical care units, Planning & designing a computerized critical care unit.
- 4.3 Physiotherapy: Software Diathermy, microwave diathermy, Ultrasound therapy unit.
- 4.4 Electrotherapy Equipments, Ventilators.

Reference Books:

1. R.S.Khandpur, "Hand book of Biomedical Instrumentation", TMH
2. Walter Welko- Witz and Sid Doutsch, "Biomedical Instruments: Theory and Design" Wiley
3. Lesile Cromwell, Fred J. Weibell & Erich A. Pfeiffer, "Biomedical Instrumentation & Measurement