

EC8073 MEDICAL ELECTRONICS

DETAILED SYLLABUS

OBJECTIVES:

The student should be made:

- To gain knowledge about the various physiological parameters both electrical and non electrical and the methods of recording and also the method of transmitting these parameters
- To study about the various assist devices used in the hospitals
- To gain knowledge about equipment used for physical medicine and the various recently developed diagnostic and therapeutic techniques.

UNIT I ELECTRO-PHYSIOLOGY AND BIO-POTENTIAL RECORDING

Sources of bio medical signals, Bio-potentials, Biopotential electrodes, biological amplifiers, ECG, EEG, EMG, PCG, typical waveforms and signal characteristics

UNIT II BIO-CHEMICAL AND NON-ELECTRICAL PARAMETER MEASUREMENT

pH, PO₂, PCO₂, Colorimeter, Blood flow meter, Cardiac output, respiratory, blood pressure, temperature and pulse measurement, Blood Cell Counters.

UNIT III ASSIST DEVICES

Cardiac pacemakers, DC Defibrillator, Dialyser, Ventilators, Magnetic Resonance Imaging Systems, Ultrasonic Imaging Systems.

UNIT IV PHYSICAL MEDICINE AND BIOTELEMETRY

Diathermies- Shortwave, ultrasonic and microwave type and their applications, Surgical Diathermy, Biotelemetry.

UNIT V RECENT TRENDS IN MEDICAL INSTRUMENTATION

Telemedicine, Insulin Pumps, Radio pill, Endomicroscopy, Brain machine interface, Lab on a chip.

TEXT BOOK:

1. Leslie Cromwell, —Biomedical Instrumentation and Measurementll, Prentice Hall of India, New Delhi, 2007. (UNIT I – V)

REFERENCES:

1. Khandpur, R.S., —Handbook of Biomedical Instrumentationll, TATA Mc Graw-Hill, New Delhi, 2003.

2. John G. Webster, —Medical Instrumentation Application and Designll, 3rd Edition, Wiley India Edition, 2007

3. Joseph J. Carr and John M. Brown, —Introduction to Biomedical Equipment Technologyll, John Wiley and Sons, New York, 2004.