

13EE42E4-BIO-MEDICAL ENGINEERING
(EEE)

Lectures/Week: 4Hrs.
End Exam Duration: 3Hrs

Credits: 4
Sessional Marks: 40
End Exam Marks: 60

UNIT-I

Human cell and its electrical characteristics neuron and impulses, Recording Electrodes-Electrode-Electrolyte interface, polarizable – Non-polarizable Electrodes, body surface recording Electrodes, internal Electrodes, Micro Electrodes, Electrode array & Practical hints in using Electrodes

UNIT-II

Bioelectric potential and cardiovascular measurement circulatory system of heart- ECG anatomy and function of heart abnormal cardiac Rhythms – Arrhythmias – Einthoven triangle. EEG recording system(10-20 electrode system) Biorhythms – sleep pattern

UNIT-III

Therapeutic and prosthetic devices, cardiac pace maker, types – asynchronous and synchronous modes of operation(Demand). Asynchronous pace maker – working principle and function demand PM – working principle – QRS triggered and atrioventricular synchronized PM lead wires and electrodes, cardioverter.

Defibrillator : working principle of DC defibrillation electrodes used. Infant incubator and lithotripsy

UNIT-IV

Electrical hazards in medical instruments macro and micro shock – devices to protect against electrical hazards – ground fault interrupter, isolation transformer, line isolation monitor, receptacle tester, electrical safety analyzer equipment, preventive maintenance.

UNIT-V

Recent trends : Ultrasonography – lasers principle and operation of laser types of lasers – pulsed Ruby laser – ND-YAG laser – Helium-Neon Argon laser-c02 laser excimer laser, semiconductor lasers – laser safety.

TEXT BOOKS:

1. Seslie Cromwell, Fres J.Weibell and Esich A.Plefittes “BioMedical Instrumentation & Measurements”, pearson education.
2. L.A Geddes and L.E Baker – Principles of Applied Bio Medical Instrumentation, John Wiley,

REFERENCES:

1. Reichard Aston, Principles of Bio Medical Instrumentation and Measurements ,Mervill Publishing Company.

2. R.S. Khandpur "Handbook of Bio Medical Instrumentation" Tata Mc Graw Hill, M.Arumugam, Bio Medical Instrumentation, Anuradha Agencies Publisher, Vidyal Karappu-612606, Kumbakansam, R.M.S..
3. B. John and J.G.Webser Medical and Clinical Engineers, Prentice Hall.