

PHOE 4218 OPEN ELECTIVE - II
CHOICE BASED CREDIT SYSTEM COURSE (2021-2025)
MEDICAL PHYSICS

Total hours: 39

Prerequisite: PUC Pass.

The objective of the course:

1. To promote the application of Physics
2. Understand the anatomy of the nervous system and its signal measurements (EMG, CAT).
3. Analyze and understand the applications of the imaging techniques transmission(x- ray and ultrasound)
4. Updating the knowledge in recent trends in medical field.

1. MECHANICS OF HUMAN BODY

Static , Dynamic and Frictional forces in the Body – Composition, properties and functions of Bone– Heat and Temperature – Temperature scales – Clinical thermometer – thermograph – Heat therapy – Cryogenics in medicine – Heat losses from body – Pressure in the Body – Pressure in skull, Eye and Urinary Bladder. (7 Hours)

2. PHYSICS OF RESPIRATORY AND CARDIOVASCULAR SYSTEM

Body as a machine – Airways – Blood and Lungs interactions – Measurement of Lung volume Structure and Physics of Alveoli – Breathing mechanism – blood Pressure – direct and indirect method of measuring. (8 Hours)

3. ELECTRICITY IN THE BODY

Nervous system and Neuron – Electrical potentials of Nerves – Electric signals from Muscles, Eye and Heart – Block diagram and working to record EMG – Normal ECG waveform – Amplifier and Recording device – Block diagram and working to record ECG – Patient monitoring – Pace maker. (8 Hours)

4. SOUND AND LIGHT IN MEDICINE

General properties of sound – Stethoscope – Generation, detection and characteristics of Ultrasound– Ultrasound imaging technique – A scan and B scan methods of ultrasound imaging – properties of light – Applications of visible UV,IR light , and Lasers in medicine – Microscope – Eye as an optical system- Elements of the Eye. (8 Hours)

5. DIAGNOSTIC X- RAYS AND NUCLEAR MEDICINE

Production and properties of X- rays – Basic Diagnostic X-ray Machine – X-ray image - Live X-ray image – Radioactivity sources for nuclear medicine – Basic instrumentation and clinical applications Principles of Radiation Therapy- Nuclear medicine imaging devices – Radiation sources. (8 Hours)

REFERENCES:

1. John R. Cameron and James G. Skofronick, John Wiley & Sons –Medical Physics, Wiley – Interscience Publications ,1978.
2. R.S.Khandpur – Handbook of Biomedical Instrumentation, Tata McGraw Hill Publication Co.,Delhi,1987.