Module code	SP-4304			
Module Title	Physics of Medicine and Biology			
Degree/Diploma	Bachelor of Science (Applied Physics)			
Type of Module	Major Option			
Modular Credits	4	**Total student Workload**	10	hours/week
		Contact hours	4	hours/week
Prerequisite	None			
Anti-requisite	None			

Aims

This module aims to provide knowledge of physics applied in medicine and biology.

Learning Outcomes

On successful completion of this module, a student will be expected to be able to:

Lower order :	0%	None
Middle order :	30%	- explain and interpret forces exerted on bones and tissues, forces in stationary and moving fluids, laminar viscous flow and physics of blood flow. - explain the transport across membranes, medical use of radiation and impulses in nerves and cells
Higher order:	70%	- analyse the methods of production and detection of medical radiation, diagnostic radiography, angiography, mammography, computed tomography - evaluate radiation doses, use of radioisotopes for diagnostic purposes and medical treatment - critically evaluate the risk versus benefit of some of the medical diagnostic and therapeutic tools such as CT, PET, MRI, US, Nuclear Medicine. - interpret the results of analyses, and make appropriate reports and presentations

Module Contents

- Biomechanics: forces exerted on bones and tissues, forces in stationary and moving fluids, laminar viscous flow and physics of blood flow
- Transportation across membranes: flow of water and solute through membrane due to hydrostatic and osmotic pressure differences, the artificial kidney, counter current transport
- impulses in nerves and cells: electrostatics of a resting cell membrane, cable model of axon
- medical use of radiation: production and detection of medical radiation, diagnostic radiography
- biological effects of ionizing radiation
- nuclear medicine: use of radioisotopes for diagnostic purposes and medical treatment, positron emission tomography.
- Magnetic Resonance Imaging (MRI): magnetic moments, chemical shifts, RF pulses, detection of signals, imaging technique, spin-lattice (T1) and spin-spin (T2) relaxation times, functional NMR.

Assessment	Formative assessment	In-class questions and feedback
	Summative assessment	Examination: 0%
		Coursework: 100% - 2 class tests (30%) - 1 group work (20%) - 2 written assignment (40%) - 1 oral presentation (10%)