4193 - HUMAN BIOLOGY TECHNIQUES AND APPLICATIONS - II

Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)					
Lectures	Practical	Credits			Theory		Practical Ex.		Total	
3	3	6	25	25	3 Hrs	100	50		200	
Pre-requisite		Source								
Nil		MEX								

Semester	Theory	Test	Total	TW	PR	Gr Total
	75	25	100	50	—	150

Rationale : In order to understand the interaction of the medical equipment with the human body , the students should have basic knowledge of various systems, related organs, secreted fluids, etc. This paper covers Anatomy and Physiology of the human body. The emphasis will be on :
The locations, functions of various systems and organs, Biopotential development, Various body fluids and their normal composition, The medical terminology.

COURSE CONTENTS	Hrs	Mks
1. NERVOUS SYSTEM Nerve Cells: Electrical phenomena in nerve cells, Ionic basis of excitation and conduction, properties of mixed nerves, nerve fibre types and function, glia.; Synaptic and Junctional transmission: synaptic transmission, functional anatomy, electrical events at synapses, Inhibition and facilitation at synapses, chemical transmission of synaptic activity, neuromuscular transmission, myo-neural junction.Reflexes: Reflex arc , mono-synaptic reflexes, general properties of reflexes.Anatomy and physiology of the cerebral hemisphere, cerebellum, thalamus, hypothalamus, brainstem and spinal cord (Gross anatomy and main functions). Evoked Cortical Potentials, electroencephalogram, physiologic basis of EEG, Consciousness and sleep. Learning, memory and the functions of the neo-cortex in brief.	16	30
2. EAR AND HEARING Outer ear, middle ear and inner ear-anatomy and physiology. Tests of Hearing. Deafness and Hearing Aids	8	20
3. EYES AND VISION Anatomic considerations, Image forming mechanism, photoreceptor mechanism, Colour Vision and eye movements. Defective vision and its correction, chromatic aberration. Instruments—opthalmoscope, retinoscopy, keratometer, lensometer, tonometers.	8	20
4. BIOPHYSICS OF THE LOCOMOTOR SYSTEM Forces acting on and in the human body, statics, frictional forces, Dynamics, chemical composition of bones, strength of bones , lubrication of bone joints, measurement of bone mineral in the body. Energy, work and power of the body: Conservation of energy in the body, energy changes in the body, work and power, heat losses from the body.	6	10
5. PRESSURE Measurement of pressure in the body, Pressure in the skull, Eye pressure, Pressure in the digestive system, pressure in the skeleton, pressure in the urinary bladder pressure effects while diving.	5	10
6. EXCRETORY SYSTEM Anatomy of the kidney, urinary bladder, ureter, urethra. Formation of urine. Skin: anatomy, Formation of sweat.	5	10
Total	48	100

PRACTICAL:

The students will study the specimes of the following systems and organs. They will draw their diagrams in their journals which will be checked by the teacher. a) Neuron, b) Human Brain, c) Spinal Cord, d) Eye, e) Ear, f) Kidney and the excretory system They will also do the following: 1. Perimetry. 2. Testing of visual acuity by Snellen's Charts 3. esting for colour blindness using Isihara charts. 4. Rinne's test and Weber's test.

MINI PROJECT:

The student will have to do a small project in biological techniques on any topic in the syllabus. The student will then make a project report which will then be checked by the teacher. The project could involve making charts, models, writing small computer programs, etc.