Sem.	Course Code	Advanced Learner Course	Total Marks: 100		Hours Per Week	Credits
IV	17UAOAL406	Bio-Physics	CIA: -	ESE: 100	-	2

OBJECTIVES:

- To impart basic ideas of Bio-molecules and human body system
- To provide the knowledge of physics in other areas

COURSE OUTCOMES:

At the end of the course, Students will be able to

CO1: Understand the bonds associated with bio-molecules

CO2: Gain knowledge about human body mechanism

CO3: Analyse the biological significance of adsorption and colloids

CO4: Understand the blend of physics principles in medical instruments

CO5: Evaluate the effect of radiation exposure

UNIT I

Structure of Bio-molecules: Introduction - Atomic structure - Hydrogen atom - Bonds between atoms and molecules - secondary or weak bonds - Bond energy - Disulphate bonds – Peptide bond - Structure of Proteins - Molecular weight determination - Kinetic methods - Static methods - Structure of nucleic acids - DNA - RNA.

UNIT II: Kinetics of Molecules I

Diffusion: Factors affecting diffusion - Simple diffusion – Fick's law of diffusion - Diffusion of electrolytes - Biological significance of diffusion

Osmosis: Osmosis - Osmotic pressure - Laws of osmosis - Osmometry - osmotic pressure of Electrolytes

Filtration: Filtration - Passage of fluid though blood vessels - Formation of Urine- Dialysis Principle of dialysis in artificial kidney - kinds of dialysis.

UNIT III: Kinetics of Molecules II

Adsorption: Adsorption - Factors affecting adsorption - Adsorption of ions by Solids and Liquids - adsorption of Gases by solids - Biological significance of adsorption

Colloids: Types of colloids - characteristics of colloids - stability of colloids - Gel - Emulsions - Techniques for the separation of colloids - Biological importance of colloids - Gibb's Donnan Equilibrium.

UNIT IV

Optical Techniques in Biological Studies: Characteristics of light - compound microscope - Ultraviolet microscope - Electron microscope - Transmission electron microscope - Scanning Electron microscope - Monochromator – Light sensitive detectors- Spectrophotometer - Atomic absorption flame photometer – Electromagnetic radiation Spectroscopy - Ultraviolet, visible, infrared and fluorescent spectroscopy – Atomic absorption and emission spectroscopy - mass spectroscopy - Raman spectroscopy – x ray diffraction crystallography.

UNIT V

Bioelectricity and Radiation Biology: Membrane potential - Resting membrane potential - Action potential and nerve impulse conduction - rate of nerve impulse conduction- Recording of nerve impulses by C.R.O – Resting membrane potential - injury potential - Monophasic and diphasic action potentials - Radioactivity - Natural radioactivity - artificial or induced radioactivity – Radioactive disintegration - units of Radioactivity.

Text Books:

1. Dr.S.Palanichamy & Dr.M.Shanmugavelu - Principles of Biophysics - Palani Paramount Publications, Palani (Units I & III)
2. M.A. Subramanian – Biophysics-Principles and Techniques - MJP Publishers, Chennai [Units II, IV & V]

Reference Books:

1. Biophysics - Dr.S.Thiravia Raj - Saras Publications - Nagerkoil
2. Basic Biophysics for Biologist – M. Daniel -Agrobios (India) Jodhpur.

QUESTION PAPER PATTERN		
SECTION - A	**SECTION - B**	**SECTION - C**
10 x 2 = 20 Marks Ten questions out of 12	**5 x 7 = 35 Marks** (Either or choice) Two questions from each unit	**3 x 15 = 45 Marks** (Answer any three Questions) One Question from each unit

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