

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

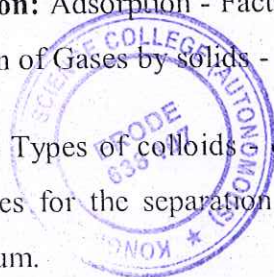
Osmosis: Osmosis - Osmotic pressure - Laws of osmosis - Osmometry - osmotic pressure of Electrolytes

Filtration: Filtration - Passage of fluid through 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.



Dr. N. RAMAN
PRINCIPAL
KONGU ARTS AND SCIENCE COLLEGE
(AUTONOMOUS)
NANJANAPURAM, ERODE - 638 107.

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 - Nagercoil
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



Dr. N. RAMAN
PRINCIPAL
KONGU ARTS AND SCIENCE COLLEGE
(AUTONOMOUS)
NANJANAPURAM, ERODE - 638 107.

HEAD OF THE DEPARTMENT
DEPARTMENT OF PHYSICS
KONGU ARTS AND SCIENCE COLLEGE
(AUTONOMOUS)
ERODE - 638 107.