

YOGI VEMANA UNIVERSITY:: KADAPA

B.Sc., Biotechnology Course Structure for the Academic year 2020-21

Semester	Title of the paper	
I	Bio-molecules & Analytical Techniques	
II	Microbiology, Cell & Molecular Biology	
III	Immunology & r-DNA technology	
IV	i	Plant & Animal Biotechnology
	ii	Environmental & Industrial Biotechnology

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B.Sc., Biotechnology: Choice based credit system

B.Sc., I Semester W.E.F. 2020-21

BT-101: Bio-molecules & Analytical Techniques

Course Objectives: To ensure students gain knowledge about the structure, properties and functions of biomolecules and characterization of biomolecules using analytical techniques.

Unit-I-Carbohydrates, Protein and Lipids

Classification, structure, properties of carbohydrates. Classification, structure and properties of amino acids, peptide bond and peptides. Classification, structure (primary, secondary, tertiary, quaternary) and functions of proteins. Denaturation and renaturation of proteins. Classification structure and properties of saturated and unsaturated fatty acids. Structure and functions of glycolipids, phospholipids, and cholesterol.

Unit-II- Nucleic acid, and Bioenergetics

Structure and functions of DNA and RNA. Free energy, entropy, enthalpy and redox potential. High energy compounds, Glycolysis, TCA cycle, Electron-Transport System and Oxidative Phosphorylation.

Unit-III-Centrifugation, Chromatography and Electrophoresis

Basic principles and types of centrifugations (Analytical and Preparative). Principle, instrumentation and application of paper, TLC, ion exchange, gel permeation, affinity chromatography. Basic principles and types of electrophoresis, factors affecting electrophoretic migration. PAGE (Native, SDS-PAGE). Introduction to 2D & Isoelectric Focusing, Pulsed Field Gel Electrophoresis.

Unit - IV-Spectroscopy, Microscopy and Laser Techniques

Beer-Lambert law, light absorption and transmission. Extinction coefficient, Design and application of photoelectric colorimeter and UV-visible spectrophotometer. Introduction to crystallography and application. Types and design of microscopes - compound, phase contrast, fluorescent electron microscopy (TEM, SEM). Introduction to radioisotopes, measurement of radioactivity (scintillation counter and autoradiography). Pros and Cons of usage of radioactive material in life sciences.

P. K. S. P. a. s. h. y. e. r. A. s. h. e. r. e.
K. Subbaraj d. i.
12-11-2020

