



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Science

Department of Life Science

Generic Elective (GE) Under Graduate Courses

SEMESTER V

COURSE CODE	Category	COURSE NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTUG501	GE	Biology for Engineers	60	20	20	0	0	3	0	0	3

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment shall be based following components: Quiz / Assignment / Project / Participation in Class, given that no component shall exceed more than 10 marks.**

Course Objectives:

1. To understand the application of biological systems.
2. To learn the basic step in energetic
3. To provide drug design through molecular modeling
4. To learn the fundamentals of biosensors.
5. To expose the students to recent advances in application of biosensors in health and environment


Course Outcome:

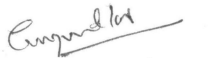
Students will be able to


1. develop the skills toward designing/improving biological systems
2. provide a frame-work for system biology
3. identify potential use of Computational Biology in drug designing
4. realize the significance of use of Biosensor in Health and Environment.

UNIT – I: Introduction

- Blueprint of Life
- Cells, Cell structure and Function, Structure of prokaryotic and eukaryotic cells
- Biomolecules, Vitamins,
- Function of water soluble vitamins; Fat soluble Vitamins A, D, E and K


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BTUG501: Biology for Engineers

UNIT – II: Introduction to Bioenergetics

- Metabolism
- Energy production process, Redox reactions
- Thermodynamics and Biological Systems
- Bioenergetics and Significance in biological process

UNIT – III: System Biology

- Introduction, History of system biology
- Mathematical Modeling, Ordinary Differential equations, 1st and 2nd order DE
- Key Assumptions of ODEs based models, Modeling of spread of diseases
- Significance and Applications of mathematical models in biological systems

UNIT – IV: Computational Biology


- Molecular Modeling
- Computer aided drug designing, SBDD, LBDD
- Applications of Computers in Drug and Vaccine development
- Basic introduction of softwares Autodock, ligplot


UNIT – V: Biosensors

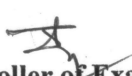
- Introduction of Biosensors, History of biosensors
- Basic Design of Biosensors. Biosensor elements
- Types of Biosensors, Optical and EC Biosensors
- Application of Biosensor in Health and Environment management

BOOKS:

- Biology: A Global Approach, Global Edition, 12th Ed. By Neil Campbell , Ed 2020
- Molecular Biology Of The Cell, 7th Edition By Bruce Alberts
- An Introduction To Systems Biology: Design Principles Of Biological Circuits (Chapman & Hall/Crc Computational Biology Series) By Uri Alon Ed. 2019.
- Jeong-Yeol Yoon, Introduction To Biosensors, Springer-Verlag New York Ed. 2016.


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