

MLD- Fundamentals of Biotechnology

Credits: 3 (T)
(Teaching Hours – 4)

Learning Objectives: This course introduces the basics and fundamental concepts of biotechnology that covers the diversity of life, different kingdoms of living life, as well as applications of biotechnology in several fields.

Course Outcome: The students will be able to learn the basics biology, classification of the living organisms, nomenclature, and anatomy of different living systems. Also, they will be learned cell biology and application of biotechnology.

Unit I

Biodiversity and Classification: Classification of the living organisms -five kingdom classification concepts. Salient features of animals-non-chordates up to phylum level and chordates up to class level;salient features of plants -Angiosperms up to class.

Unit II

Structural arrangements of animal and plant systems: Anatomy and functions of animal organs- digestive, circulatory, respiratory, nervous, and reproductive. Anatomy and functions of dicots and monocots plants.

Unit III

Cell-Fundamental unit of life: Differentiate between plant and animal cell; cell envelope; cell membrane, cell wall. Cellular organelles - structure and function; endoplasmic reticulum, Golgiapparatus, lysosomes, vacuoles, mitochondria, ribosomes, plastids, microbodies; cytoskeleton, cilia, flagella, centrioles; nucleus.

Unit IV

Human Diseases and Public Health Issues: Pathogens and parasites causing human diseases (dengue, chikungunya, dengue, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ring worm) and their control; cancer, diabetes, HIV and AIDS; Adolescence - drug and alcohol abuse.

Unit V

Biotechnological Applications: General perspectives of Biotechnology: Genetic engineering applications of biotechnology. Application of Biotechnology in health and agriculture: Production of Human insulin and vaccines.

Text Books

1. The Cell: A Molecular Approach. 2019, 8th Edition, Oxford University Press, Author:Geoffrey Cooper.
2. Biotechnology Fundamentals, 2017, 2nd Edition, CRC Press, Author: Firdos Alam Khan
3. Life: The Science of Biology, 2012, 10th Edition. Authors: David E. Sadava, David M. Hillis, H. Craig Heller and May Berenbaum.
3. Biology of Plants, 2005, 7th Edition, New York: W.H. Freeman and Company. ISBN 0-7167-1007-2 Authors: Raven Peter H, Evert Ray F and Eichhorn, Susan E.
4. General Microbiology, 2007, 5th edition, MacMillan Press. Authors: Stanier R. Y, Adelberg E.A and Ingraham J. L