



जननायक चंद्रशेखर विश्वविद्यालय, बलिया  
Jananayak Chandrashekhar University, Ballia



**w.e.f. 2022-23**

**SYLLABUS STRUCTURE SEMESTER WISE  
M.Sc. (BIOTECHNOLOGY)**

**Minor**

**Programme Name and Code: M. Sc. (Biotechnology)**Name: **Minor**

MM: 25+75=100

**Objectives:**

1. This paper aims to understand the basic concept of Biotechnology.
2. To know about the role of organism to improved the quality of environment for the benefit of human beings.
3. To understand the application of tools and techniques in biological sciences for the benefit of living beings

UNIT – 1		Credit	Hours
1a	i. History of Biotechnology. ii. Cell Structure and function: Cell theory, organization of eukaryotic cell and prokaryotic cell.	1	15
1b	i. Mendel's Laws of Inheritance and gene interaction ii. Mutations: types, mechanisms, mutagens		
UNIT – 2		Credit	Hours
2a	i. Introduction to biochemistry and biomolecules. ii. Chemical foundations of biology- pH, pK, acids, bases and buffers	1	15
2b	i. Classification, nomenclature and general properties of enzymes; kinetics of enzyme actions, rate of enzyme catalyzed reactions with special reference to Michaelis Mentenlaws; units of enzyme activity. ii. Factors affecting enzyme activity (substrate concentration, temperature, pH and inhibitors). iii. A brief description of various types of coenzymes, isozymes and zymogens. Enzyme inhibition- competitive, non-competitive and uncompetitive types. Briefintroduction to active site		
UNIT – 3		Credit	Hours
3a	i. Micro organism its structure & application in respect of Biotechnology ii. rDNA technology, PCR, types of PCR and its applications	1	15
3b	i. Basic concepts of Immunology: (a) Innate and acquired immunity. (b) Concept of Humoral & Cell Mediated Immunity. ii. Antibody antigen interaction, ELISA		
UNIT – 4		Credit	Hours
4	i. Ethics: Benefits of biotechnology, ELSI of biotechnology, Recombinant therapeutic products for human health care, ii. Genetic modifications and food consumption, release of genetically engineered organisms. iii. Biotechnology in developing countries	1	15

**INTERNAL ASSESSMENT**

Attendance: 5

Assignment / Presentation: 10

Class test: 10

**TRANSACTIONAL STRATEGIES**

Lectures, tutorials, demonstrations, field practicals, teaching tools (photographs, models, charts, etc.), OERs, digital libraries, etc

**Book References**

1. Benjamin Lewin, *Gene VIII*, Oxford University press, U.K.
2. De Robertis, E.D.P. & De Robertis, Jr. E.M.F. (1987). *Cell and Molecular biology*. Lea and Febiger, U. S.
3. Dube, R.C. (2014). *A Text Book of Biotechnology*. S. Chand & Company Ltd., New Delhi.
4. Sheeler, P. & Bianchi, D.E. (2009). *Cell and Molecular Biology*. Wiley.
5. Singh, B.D. (2009). *Biotechnology*. Kalyani Publishers, New Delhi.
6. T. A. Brown, *Genomes*, Wiley Publishers (Asia Pvt Ltd)
7. Verma, P.S. & Agarwal, V.K. (2016). *Cell biology*. S. Chand & Company Ltd., New Delhi.