

Department of Biotechnology
Delhi Technological University, Delhi-42
Programme: M.Sc. (Biotechnology)

SEMESTER I	
MSBT- 101 (Biochemistry)	
CO	Statement
1	Analyse the chemistry of biomolecules.
2	Compare and contrast different types of biomolecules
3	Understand the concept of Metabolism and Bioenergetics.
4	Analyse the Carbohydrate Metabolism and its regulation.
5	To gain knowledge about the Lipid and Cholesterol metabolism.
MSBT-103 (Cell and Developmental Biology)	
CO	Statement
1	To learn the mechanisms of biological processes involved in gene expression
2	To explain the concept of cell cycle and cell division and the impact of excessive cell proliferation
3	To comprehend mechanisms of cellular signaling and protein targeting within the cell or to the cell exterior
4	To gain insight into the strategies for gene silencing
5	To appraise various Cell & Molecular Biology techniques
MSBT-105 (Molecular Biology)	
CO	Statement
1	To understand the structure of DNA, chromosome, and RNA
2	To know the molecular mechanism of DNA damage repair
3	To learn the basic mechanisms of biological processes involved in gene expression
4	To gain insight into the strategies for gene silencing
5	To appraise various genetic manipulation, DNA sequencing, DNA amplification, and individual characterization techniques
MSBT-107 (Analytical Techniques)	
CO	Statement
1	Discuss the principle of centrifugation and its types.
2	List uses of electrophoretic techniques underlying electrophoresis systems.
3	Discuss chromatographic methods.
4	Explain spectroscopic and diffraction techniques.
5	Define optical techniques like microscopy.

	MSBT-109 (Biostatistics and Computer Applications)
CO	Statement
1	Understand the role of Biostatistics and Probability.
2	To know the basics of Random variable and distribution function.
3	To gain insight into Probability distributions.
4	To gain knowledge about Correlation, regression and sampling distributions.
5	To learn the Knowledge-based exact sampling distributions and computer applications
SEMESTER II	
	MSBT-102 (Immunology)
CO	Statement
1	Elucidating the molecular and cellular mechanisms involved in immune responses and their contribution to immunity and disease prevention..
2	Exploring the different types of immune cells, their roles in humoral and cellular immunity.
3	Exploring advanced therapeutics and clinical implications of autoimmunity, hypersensitivity, and immunodeficiencies.
4	Application of knowledge of immunology for development of diagnostic and therapeutic tools and techniques.
5	Exploring vaccine development, cancer therapies and novel immunotherapies.
	MSBT-104 (Microbiology and Industrial Applications)
CO	Statement
1.	Understand the History and Introduction of Microbiology.
2.	To gain insight the structure of Microbe, its growth curve, and kinetics.
3.	Compare and contrast Host–Pathogen interactions.
4.	Appraise the Role of microorganisms and their Influence on the Earth’s Environment.
5.	Learn the basics of media formulation, sterilization, and inoculum development.
	MSBT-106 (Genetic Engineering)
CO	Statement
1	Understand the construction and functions of different vectors implied in the field of Genetic engineering.
2	Acquire knowledge on various enzymes involved in recombinant DNA technology.
3	Acquire knowledge on cloning system and genetic engineering.
4	Understand the various types of PCR and its application.
5	Understand the modern genetic engineering concepts for biotechnology thereby employ the students in research.
	MSBT-108 (Genetics)
CO	Statement
1	Understanding of the basic principles of genetics in Biotechnology
2	Imparting knowledge about genetic techniques
3	Analysis of genetic data obtained from experiments or databases
4	Knowledge of ethical and social implications of genetics
5	Learning of application of genetics in other disciplines

	MSMA-114 (Fundamentals of Computer)
1.	To enlist biological databases such as NCBI, PubMed, Entrez, etc., and identify database types, sequence formats, sequence retrieval, and submission.
2.	To define genomics and recognize the importance of the Human Genome Project.
3.	To perform and apply programming techniques to analyze and manipulate bioinformatics data.
4.	To perform Pairwise Sequence Alignment and learn about scoring matrices and the various algorithms involved.
5.	To perform Multiple Sequence Alignment and various algorithms involved.
	MSBT-1105 (GE 1) Environmental Biotechnology
CO	Statement
1.	To understand the environmental pollution & its impact on the environment
2.	To gain knowledge on different sources, impacts, and measurement parameters for air, and water pollution
3.	To impart knowledge on sources of solid waste, vermiculture, composting and bioremediation
4.	To understand the impact of acid rain, ozone depletion, and biotechnological approaches for management.
5.	To understand the environmental pollution & its impact on the environment
	SEMESTER III
	MSBT-201 (Bioprocess Engineering & Technology)
CO	Statement
1.	Understand the basic principle of Biochemical engineering.
2.	compare the different types of fermenters and their mode of operation.
3.	To gain insight to the working of Downstream processes at an industrial scale.
4.	Understand the application of enzymes and microbes in food process operations.
5.	Illustrate the enzyme kinetics, its mechanism and inhibition along with production, recovery
	MSBT-203 (Immunotechnology & Molecular Virology)
CO	Statement
1.	Understand the Principles of Immunization.
2.	Learn the basics of Immunological Techniques.
3.	To gain insight into Vaccine Technology.
4.	Understand the Genome organization of bacteriophages, plant and animal viruses;
5.	Learn the Methods to study viruses.
	MSBT-205 (IPR & Biosafety)
CO	Statement
1.	Understanding the significance of intellectual property and biosafety principles.
2.	Mastering the concept of & “prior art and proficiently conducting patent searches.
3.	Gaining knowledge of patent basics and procedures for effective patent filing.
4.	Developing practical skills in patent filing and understanding patent infringement.

5.	Comprehending biosafety principles and regulations governing production and use of GMO release.
	MSBT-217 {Nanobiotechnology (DSE 1)}
CO	Statement
1.	Understand the basics concepts of nanosciences and its applications.
2.	Illustrate the synthesis process and mechanism of nanomaterials.
3.	Applications of different types of nanomaterials and its compositions.
4.	Illustrate the applications of Nanobiotechnology.
5.	Understanding the toxicological effects of nanomaterials and its management.
	MSBT-204 (Genomics and Proteomics)
CO	Statement
1	To appraise various generations of DNA sequencing technologies and genome projects
2	To understand the fundamentals of comparative genomics and transcriptomics and to appraise various gene expression profiling techniques
3	To comprehend genome-wide protein analysis by sequencing, electrophoretic and spectrometric techniques
4	To get insight into various techniques for isolation and analysis of DNA-protein and protein-protein complexes
5	To appraise the concept of personalized medicine based on pharmacogenomics
	MSBT-2065 {(GE2)Bioenergy}
CO	Statement
1	To gain understanding on the global energy scenario, and biofuel production
2	To understand the concepts of bio-ethanol production
3	To impart knowledge on the production of biohydrogen by agricultural residues
4	To gain understanding on the concepts of biodiesel production
5	To understand the concepts of applied bioenergy with reference to Indian context