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

	SEMESTER I
	BIO-501 (Introduction to Bioinformatics)
CO	**Statement**
1	To enlist biological databases 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.
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.
	BIO-503 (Advance proteomics)
CO	**Statement**
1	Understand the basics of proteome and Genome.
2	To gain insight of protein detection and its data bases.
3	Compare and contrast Proteome analysis.
4	Learn the basics of protein-protein interactions.
5	Understand Protein chips and functional proteomics.
	BIO-5407 (OMICS in medicines)
CO	**Statement**
1	Comprehend the principles and applications of omics technologies, including the sequencing of genomes in humans and other organisms.
2	Understand the role of genomics in identifying infectious disease microbes, molecular epidemiology, host resistance, pathogenicity, and disease control.
3	Studied the utilization of genomics for identifying genetic disorders and guiding treatment strategies via pharmacogenomics.
4	Concieved the idea on role of epigenomics and non-coding RNAs in diseases development, inheritance and control.
5	Learn about translational and clinical trials, which evaluate the effectiveness and safety of interventions, bridging scientific research with practical applications.
	SEMESTER II
	BIO-502 (Advances in Bioinformatics)
CO	**Statement**
1.	To identify and utilize various genetic databases relevant to complex disorders.
2.	To understand the types and mechanisms of genomic variations in complex disorders and apply bioinformatics tools.
3.	To apply bioinformatics tools for visualizing structural information of proteins and managing pharmacogenomic information.
4.	To conduct phylogenetic analysis and utilize prediction tools for studying genetic relationships in complex disorders.

5.	To understand the role of bioinformatics in the drug discovery and development process for complex disorders.

BIO-504 (High Throughput structural Biology)

CO	Statement
1.	Understand the structural biology and different types of bonds in protein structure.
2.	To know the basics of X-Ray Crystallography and NMR.
3.	To gain insight of optical spectroscopy
4.	To gain knowledge about Potential Energy Minimization and its Function,
5.	To learn the Knowledge-based Protein Modeling

BIO-5402 (Advanced Genetic Engineering)

CO	Statement
1	To understand basic genetics concepts, inheritance patterns, and the history of genetic diseases.
2	Explore the molecular basis of both common and rare genetic disorders, including chromosomal aberrations and mutations.
3	Learn various approaches for identifying genetic disorders, such as linkage mapping, genome-wide association studies, and genome sequencing.
4	Examine the role of epigenetics in human genetic disorders, including its mechanisms, phenotypic changes, and inheritance patterns.
5	Gain skills in risk assessment and prediction of genetic disease inheritance, and understand the ethical considerations in genetic disease treatment.

BIO-5308 (Immunoinformatics)

CO	Statement
1	Gain a comprehensive understanding of the immune system.
2	Explore advanced topics in immunology and applications of immunotherapeutics.
3	Develop expertise in HLA supertype analysis and its applications.
4	Acquire practical skills in in-silico prediction of immunogenicity and artificial intelligence techniques for predicting antigen binding profiles.
5	Explore the application of computational biology in immunoinformatics with detailed analysis of case studies.

BIO-6401 (Drug Design and Discovery)

CO	Statement
1.	Acquire a comprehensive understanding of drug discovery fundamentals.
2.	Demonstrate proficiency in applying receptor theory, exploring receptor agonists and antagonists for targeted drug design.
3.	Aquire practical skills for utilization of diverse methodologies in drug development.
4.	Gain insight into the crucial stages of preclinical and clinical studies for drug development.
5.	Exploring the diverse strategies for drug discovery and development, vaccine design and personalized medicine and its applications.

BIO-6301 (Nanotechnology in Healthcare)

CO	Statement
1.	Understanding of nanotechnology and pharmaceutical applications.
2.	Illustrate the immunoassay techniques and nanomaterials implementations.
3.	To explain application of improved medical diagnostics
4.	Demonstrate various application of prosthetics and Medical implants
5.	To comprehend diagnostic methods and stem cell technology

	BIO-6207 Entrepreneurship
CO	Statement
1	To understand the importance of Entrepreneurship and Innovation in Biotechnology
2	To equip students with the concepts of Intellectual property rights in biotechnology (patents, trademarks, copyrights)
3	To impart knowledge on Biotechnology Commercialization and Financing
4	To understand the role of biotechnology incubators and accelerators, Accessing biotechnology-focused entrepreneurial support networks
5	To develop biotechnology entrepreneurial skills