



DPG DEGREE COLLEGE
(Affiliated to MDU Rohtak)
Sector-34, Near Marble Market, Gurugram
Department of Biochemistry

Biochemistry Program out comes listed as follows:

1. To understand the concepts of chemical structures of carbohydrate, and their structural and metabolic role in cellular system
2. To understand the concepts of theoretical knowledge of various instruments and their practical applications like X-ray crystallography, Centrifugation & Electrophoresis, and Protein Sequencing.
3. To understand the learn about nucleic acid as genetic information carriers, Possible modes of replication, and roles of helicase, primase, DNA Polymerase, DNA ligase, and Regulation.
4. To understand the chemistry of carbohydrates, lipids, proteins and nucleic acids.
5. To understand the concepts, understand the basic concepts of nutrition, and nutritional values of foods, and Basal metabolic rate.

S.No.	COURSE OBJECTIVES	COURSE OUTCOMES
1.	M.Sc. (Biochemistry) Ist SEMESTER	
	Paper: Biomolecules	
	<ol style="list-style-type: none"> 1. This course is designed to introduce the organic structure of living systems mainly dealing with biomolecules like carbohydrates, proteins, lipids, and nucleic acids. 2. To help students to understand the foundation for other advanced courses like physiology, cell biology, molecular biology, and immunology. 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. To understand the concepts of chemical structures of carbohydrate, and their structural and metabolic role in cellular system 2. To understand about structure and function of lipids, circulating lipids and inflammatory lipid mediators etc. 3. The students will understand about the structure and function of nucleosides and nucleotides.
	Paper: Cell Structure and Signalling	
	<ol style="list-style-type: none"> 1. To understand the fundamentals of cell biology like cell organelles, cytoskeleton, cellular transport 2. To help students to understand cell-extracellular matrix interaction, cell division, and protein trafficking and signal transduction etc. 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. The student will learn about structural organization of prokaryotic and eukaryotic cells, ultra-structure and functions of cell organelles 2. To understand the concept of Cell-Extracellular matrix interactions, Basics of signal transduction. 3. To understand about protein trafficking in cells, Protein sorting, vesicular Transport and protein targeting.

	Paper: Human Physiology	
	<ol style="list-style-type: none"> 1. To learn and understand the fundamentals of physiology. 2. This course is designed to impart knowledge of functioning of circulatory, respiratory, digestive and excretory system 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. . To understand the concepts of the basics of circulatory system, the fundamentals of digestive system. 2. To understand the concepts the fundamentals of Respiratory system and Neural & chemical regulation of respiration. 3. To understand the basics of excretory system like structure of nephron, glomerular filtration, reabsorption and tubular secretion
	Paper: Metabolism and Regulation	
	<ol style="list-style-type: none"> 1. To learn and understand the fundamentals of cellular metabolism of carbohydrates, lipids, aminoacids, and nucleic acids. 2. To help students to understand various metabolites association with various metabolic diseases 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. To learn Carbohydrate catabolism, and its association with cellular energy production, and carbohydrate anabolism. 2. To understand the concepts of Lipid biosynthesis, Degradation of fatty acids and cholesterol, ketone bodies, acidosis, ketosis. 3. To understand about the Biosynthesis of purines and pyrimidine nucleotides, degradation of nucleotides.
	Paper: Enzymology	

	<ol style="list-style-type: none"> 1. To understand the importance of enzymes, their classification, and properties. 2. To understand the mechanism of enzyme action, their kinetics and types of enzyme inhibitions. 3. To make them understand about the advantages of immobilization of enzymes, methods of immobilization. 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. To acquire the knowledge of enzymes their properties and classification, Mechanism of action, Michaelis-Menten initial rate equation. 2. To understand the concepts of enzyme kinetics, effect of enzymes concentration, pH and temperature on kinetics of enzyme reactions, enzyme inhibition. 3. To understand the different immobilization techniques and Industrial and clinical scope of enzymes.
2.	M.Sc. (Biochemistry) IInd SEMESTER	
	Paper: Immunology	
	<ol style="list-style-type: none"> 1. To apprise the students about components associated with immune system and molecular mechanism of their working. 2. The course also deals with implications of deregulation of basic regulatory networks that lead to immune system related disorders. 4. The students will be able to describe the roles of the immune system in both maintaining health and contributing to disease. 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. To understand the fundamental principles of immune response including molecular, biochemical and cellular basis of immune homeostasis. 3. To understand various aspects of immunological response and how its triggered and regulated. 4. To understand the rationale behind various assays used in immunodiagnostic of diseases and will be able to transfer knowledge of immunology in clinical perspective.
	Paper: Biophysical Techniques	

	<ol style="list-style-type: none"> 1. The course will help students to acquaint with basic instrumentation, principle and procedure of various sophisticated instruments like Fluorescence microscope, HPLC, GLC and NMR etc. 2. This will enable the students to implement the use of these techniques in biological research and in discovering new products/compounds. 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. To understand the concepts of theoretical knowledge of various instruments and their practical applications like X-ray crystallography, Centrifugation & Electrophoresis, and Protein Sequencing. 2. The students will be able to implement the use of instruments like chromatography, UV-VIS spectroscopy, NMR, CD, ORD in biological research. 3. To understand the procedure of various sophisticated instruments like phase contrast, fluorescence, electron microscopy.
Paper: Molecular Biology		
	<ol style="list-style-type: none"> 1. The objective of the course is learning and understanding the fundamentals of molecular biology like nucleic acid as genetic material, replication, gene organization and its regulation etc. 2. The application of the course lays the foundation to understand the disease processes. 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. To understand the learn about nucleic acid as genetic information carriers, Possible modes of replication, and roles of helicase, primase, DNA Polymerase, DNA ligase, and Regulation. 2. To understand the concepts regulation of Eukaryotic DNA replication, along with Mitochondrial and Chloroplast DNA Replication. 3. To understand the learn about mechanism and regulation of transcription in prokaryotes along with Reverse transcription
Paper: Basic Biochemistry		

	<ol style="list-style-type: none"> 1. To familiarize the basic concepts of Biochemistry. 2. The student will be able to understand of all the classification of biomolecules and their biochemical functions. 3. To make them understand the structures of biomolecules and their properties that help to sustain life 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. To understand the chemistry of carbohydrates, lipids, proteins and nucleic acids 2. To understand the classification carbohydrates, lipids and structural organization of proteins. 3. To understand the classification of enzyme. 4. To understand the mechanism of enzyme action and factors affecting it.
--	---	--

Paper: Nutritional Biochemistry

	<ol style="list-style-type: none"> 1. The objective of this course is to learn and understand the basic concepts of nutritional biochemistry which comprises nutritional values of foods, dietary requirements of carbohydrates, lipids and proteins, nutritional significance of minerals. 2. To understand the factors responsible for malnutrition and measures to overcome malnutrition in infants and adults. 	<p>After the completion of the course, students will be able to</p> <ol style="list-style-type: none"> 1. To understand the concepts understand the basic concepts of nutrition, and nutritional values of foods, and Basal metabolic rate. 2. To learn and understand the dietary requirement of carbohydrates, lipids and proteins and their biological significance. 3. To understand the nutritional requirement and significance of dietary minerals like calcium, phosphorus, magnesium, iron, iodine, zinc and copper and vitamins.
--	--	---

S.No.	COURSE OBJECTIVES	COURSE OUTCOMES
1.	M.Sc. (Biochemistry) IIIrd SEMESTER	
Paper: Genetics		
	<ul style="list-style-type: none"> • The knowledge to design, conduct and analyse the experimental results in animal and human model systems • Skills of applying the genetic technologies in industries related to pharmaceuticals, biotechnology, and diagnostic clinics. • Highlighting's of mathematical, statistical and computational basis of genetic analysis that use genome data sets in system biology. • To bring awareness to human society on various genetic disorders, its inheritance patterns and to develop the methods, and techniques of fighting against the diseases. 	<p>After the completion of the course, students will be able to</p> <ul style="list-style-type: none"> • To enable the students, understand Mendelian inheritance. • To learn the concepts of Linkage. • To know the significance of organellar inheritance. • To understand the concept of sex determination and sex linked inheritance.
Paper: Microbial Biochemistry		
	<p>This course develops concept of Classical Mendelian genetics and deviation from Mendelian principles, Microbial genome organization (Prokaryotic and Eukaryotic), Viral Genetics, Mutagenesis, Bacterial plasmids as research tools, transcription and translation in prokaryotes and eukaryotes and application of microbial genetics.</p>	<p>After the completion of the course, students will be able to</p> <ul style="list-style-type: none"> • Explain principles/concept of Prokaryotic and Eukaryotic genetics, Viral genetics and application in research. • Mutagenesis, Mutation and mutants and their significance in microbial evolution. • 3. Application of bacterial and eukaryotic plasmids in research.

S.No.	COURSE OBJECTIVES	COURSE OUTCOMES
1.	M.Sc. (Biochemistry) IIIrd SEMESTER	
Paper: Clinical Biochemistry		
	<p>. The course aims to provide an advanced understanding of the biochemical mechanisms and pathophysiological processes responsible for common biochemical disorders. The course provides an overview of normal and abnormal metabolic functions, the impact of disorders on metabolic processes, an overall picture about the molecular basis of diseases and novel strategies to prevent the diseases.</p>	<p>Understand the Basic concepts and principles of Clinical Biochemistry, detail on the various biological specimens including the process of collection, preservation and storage.</p>
Paper: Bioinformatics		
	<p>The program aims to utilize and understand biological databases to gather, store, retrieve, manage, analyze and integrate biological data for generating new knowledge. PO2 The program aims to impart extensive understanding and learning of theoretical concepts in Life Sciences. Each semester exclusively devotes at least one core course in life sciences in each semester. Basic practical methodology is incorporated as practical sessions in Laboratory courses in each semester.</p>	<p>On completion of the course the students are able</p> <ol style="list-style-type: none"> 1. To learn the basic working of a Computer in the modern era. 2. To apply basic programming languages C, HTML etc. and develop logic 3. To know Bioinformatics, its scope, importance and outreach.

