

		CO -Bioinformatics	
Semester 1	COURSE NAME		Course Outcomes
	ENGLISH	CO1	To acquaint with the basics of English grammar
		CO2	Qualify them to avail oneself of the correct pronunciation and etymology of English words
		CO3	Enable students to prepare themselves confident in formal communication
		CO4	To introduce diverse methods to write effective sentences
	CELL BIOLOGY	CO1	Knowledge about definition of cell, cell theory & specialization of plant cell
		CO2	To differentiate the concept of prokaryotic & eukaryotic cell
		CO3	To study the different cell organelles, functions etc
		CO4	To understand the concept of cell division, chromosome & types
	RESEARCH METHODOLOGY	CO1	Explain the basic concepts of research.
		CO2	How to select/identify a research topic or research problem.
		CO3	List out different methods for collecting data.
		CO4	Demonstrate data graphically.
	GENETICS	CO1	Idea about basic terminologies in Genetics
		CO2	Explain on different gene interactions
		CO3	What are the different types of mutation
		CO4	Describe genetics disorders
	INTRODUCTION TO INFORMATION TECHNOLOGY	CO1	To aware them about basic of computer and its evolution
		CO2	Learning IT emphasizes the hardware organization
		CO3	To earn knowledge of different types of memory, networks
		CO4	To summarize networks and their types of connections, topologies
PRACTICAL I	CO1	To infer the basics of computer skills.	
	CO2	Enable students to interpret the concept of word processing	
	CO3	To design a power point presentation	
	CO4	To show the calculations in the spreadsheet software.	
Semester 2	COURSE NAME		Course Outcomes
	English II	CO1	To understand the psychological burden of war
		CO2	To help them present their ideas with confidence in group discussions
		CO3	To enlighten their critical thinking skills and help to view them from diverse angles
		CO4	To enable them to write imaginatively, impactfully, clearly and accurately based on the text books.
	CO1	To learn about the fundamentals of bioinformatics and its role in the study of biological data	

		CO2	Introduction to the basic principles of sequence alignment and analysis.		
		CO3	Overview of biological macromolecular structures and techniques for structure prediction.		
		CO4	Describe the background, application, and significance of bioinformatics.		
		Introduction to Bioinformatics			
		CO1	To understand the basic structure and function of carbohydrates in human body		
		CO2	To know the types, Classification and role of lipids in human body		
		CO3	To identify the structure and role of aminoacids and proteins in human body		
		CO4	To differentiate between RNA and DNA and also their types.		
		Biochemistry			
		CO1	To understand the basics of microorganism		
		CO2	To distinguish eukarotic and prokaryotic cells		
		CO3	To get an awareness of the basic requirement to grow a microorganism		
		CO4	To differentiate virus and bacteriophage		
		General Microbiology			
		CO1	To think logically & understand the basic concepts.		
		CO2	To understanding of how to translate a linear equation into a matrix		
		CO3	To specify and manipulate basic mathematical objects such as sets, functions, and relations.		
		CO4	To understand of graphs across a structure provides answers to numerous problems in layout, networking, optimization, matching, and operation.		
		Biomathematics			
		CO1	Introduction to Primary Sequence Databases & PDB		
		CO2	Prepare hands-on work with multiple alignment tools-BLAST, FASTA, and MSA		
		CO3	To understand basic characteristics of an organism		
		CO4	To develop the skill in handling basic laboratory equipemnts		
		Practical II			
Semester 3					
		COURSE NAME		Course Outcomes	
		CO1	To introduce the concept of gene expression.		
		CO2	Enable students to learn about the construction of phylogenetic trees.		
		CO3	To know about the comparison and analysis of biological sequences.		
		CO4	To understand the principles and applications of microarray.		
		ADVANCED BIOCUMPING			
		CO1	To develop simple C programs		
		CO2	To explain different decision making statements in C		
		CO3	To know about arrays		
		CO4	To distinguish between built-in & user-defined functions		
		CO5	To distinguish between structure and unions		
		INTRODUCTION TO PROGRAMMING IN C			
		CO1	To understand how to visualise a living cell or molecule using microscopy		
		CO2	To understand the role of various spectroscopic techniques in studying biomolecules		
		CO3	To understand separation of molecules using centrifugation		
		CO4	To understand the key techniques in analysis of biomolecules		

		BASIC INSTRUMENTATION		
			CO1	Illustrate the basic principle and techniques to understand the biological problem
			CO2	Identify the physical principles responsible for maintaining the basic cellular function
			CO3	Analyze the importance of various biophysical techniques
			CO4	Recognize the applications of radioactivity techniques
		BIOPHYSICS		
			CO1	Idea about immunity and immune system
			CO2	What is the difference between antigen and antibody
			CO3	Explain how failure in immune system leads diseases
			CO4	Understand immunohematology
		IMMUNOLOGY & IMMUNOTECHNOLOGY		
			CO1	To understand the basic tools for sequence alignment.
			CO2	To learn about the construction of phylogenetic tree
			CO3	To develop simple programs using built-in functions.
			CO4	To develop programs using various decision making statements.
		PRACTICAL III	CO5	To create user defined datatypes and user defined functions
Semester 4		COURSE NAME		Course Outcomes
			CO1	Molecular basis of protein structure and their function
			CO2	3-d structure prediction followed by secondary structure of protein from amino acid sequence
			CO3	Exploring different methods of protein tertiary structure prediction
			CO4	Protein- protein interaction study
		STRUCTURAL BIOINFORMATICS		
			CO1	Differentiate between random and non random sampling
			CO2	To choose the appropriate method for collection, classification and tabulation of data.
			CO3	To compute mathematical averages
			CO4	To calculate the probability
		Biostatistics		
			CO1	To develop conceptual understanding of database management system
			CO2	to understand the fundamentals of relational systems including datamodels, database architecture, database manipulations
			CO3	to recognize the need for a database approach and comprehend the components and functions of DBMS
			CO4	to understand how a real world problem can be mapped to schemas.
		Database and their management		
			CO1	To study the basics of enzymes
			CO2	To understand the structure of enzymes
			CO3	To identify the mechanism of enzyme action.
			CO4	To get an awareness of the control of enzymes.
		Enzymology		
			CO1	To understand genetic engineering and related techniques
			CO2	Learning tools and techniques in genetic engineering-DNA manipulative enzymes

			CO3	To choose the correct gene transfer method depends on the organism
			CO4	Construction of genomic DNA library and cdna library
		Genetic Engineering		Learning techniques for production of recombinant vaccines gean therapy monoclonal antibodies
			CO1	Visualization of protein structure in three dimensional form
			CO2	Validation of predicted structure of protein
			CO3	Computational methods for predicting protein secondary and tertiary structure prediction
		Practical IV	CO4	Prediction of protein structure from sequences, Homology modeling, functional sites.
Semester 5		COURSE NAME		Course Outcomes
			CO1	Knowledge about common workflows for the analysis of proteins.
			CO2	Fundamental knowledge about quantification of proteomes.
			CO3	Understanding how to identify proteins from mass spectrometry data
		PROTEOMICS	CO4	Able to evaluate MS/MS data including de novo sequencing
			CO1	To Know about Human health and Diet
			CO2	Awareness about National Nutritional Programmes
			CO3	To Know Healthy cooking Practices and food Adultration
		HUMAN HEALTH & NUTRITION	CO4	Life style related disease and priventive methods
			CO1	To introduce the concept in perl programming.
			CO2	To familiarize the basics of webpage creation.
			CO3	To know about the basic knowledge about internet.
		WEB PROGRAMMING & PERL	CO4	To understand the development of interactive webpages.
			CO1	To know about environment and create awareness about preserving the environment.
			CO2	To know the harmful effects of pollution and prevention.
			CO3	To understand the ethical issues in medicine,health& lifescience.
		E V S	CO4	To understand the alternatives to conventional clean up technologies
			CO1	To understand the organsation of genes & genomes
			CO2	To study the function of DNA : replication,transcription,translation etc
			CO3	To understand the regulation of gene expression
		MOLECULAR BIOLOGY	CO4	Idea about experimental evidance on "DNA as genetic material"
			CO1	Practical knowledge in proteomics
			CO2	On-hands experience in protein identification with different tools
			CO3	To introduce the sample programs in perl.
		PRACTICAL V	CO4	To know about the usage of loops in programming.

Semester 6	COURSE NAME	Course Outcomes
	Molecular Modelling & Drug designing	CO1 The use of powerful computer-based technology to find and create compounds for new drugs
		CO2 Fundamental knowledge about various stages of drug discovery.
		CO3 Drug designing and discovery from data of functional genomics and proteomics.
		CO4 knowledge about different structure prediction tools
	Applied Bioinformatics	CO1 Explain the mode of operation of the most common analytical techniques
		CO2 how analytical techniques relate to the quality of the data acquire
		CO3 Critically assess current practices and identify the relative strengths and weaknesses of the this area.
		CO4 Development of skills necessary for efficient processing of biological data.
	Choice Based Course: Genetic Engineering & IPR	CO1 To understand genetic engineering and related techniques
		CO2 Learning tools and techniques in genetic engineering-DNA manipulative enzymes
		CO3 To choose the correct gene transfer method depends on the organism
		CO4 To learn how to protect an IP
	Practical VI	CO1 Performing tertiary structure prediction of proteins.
		CO2 To acquire certain practical browsing techniques for retrieved drug-related databases
		CO3 Drug Design & Docking using HEX
		CO4 Molecular Visualization Softwares – Rasmol, SPDBV etc. & Homology Modeling
	Project & Viva	CO1 Demonstrate the ability to organise a presentation in a sensible way
		CO2 Identify oneself as change agents
		CO3 Demonstrate the capacity to operate in groups.
		CO4 Create scientific reports for publication and present quality research.