Faculty of Science and Humanities
B.Sc. (Biotechnology) (Semester - 5)
In Effect from Academic Year 2023-24

Branch Name:	B.Sc. Biotechnology
Program Code:	SC101
Course Name:	Omics and Human genome Project
Course Code:	**2SC1010521**
Pre-requisite Course:	Genetic Engineering

Course Objectives:

1. To understand Scope and applications of Bioinformatics
2. To understand Components of Bioinformatics
3. To understand Genomics & Proteomics
4. To understand Human Genome Project

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
				Theory (Marks)		Practical (Marks)		
Lecture (L)	Tutorial (T)	Practical (P)	Credit	University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	Total (Marks)
2	--	--	2	35	15	--	--	50

Subject Contents:

Sr. No	Topic	Total Hours	Weightage (%)
1	• Introduction – History and Scope of Bioinformatics, • Definitions - BLAST, FASTA, RASMOL • Tools of Bioinformatics- DNA databases, Alignment – pairwise and Multiple, • Analysing Biological data using various parameters of BLAST • Protein Database • Metagenomic Database • Mechanism of submitting the biological data to the database	18	60%
2	Various types of Omics • Genomics – Types, Gene finding, various tools used for genome analysis (Introduction) • Transcriptomics – Various approaches for expression study • Proteomics – Types of proteomics, 2D PAGE, SAGE, etc. • Human Genome Project – History, Various approaches for sequencing a genome, Current status and application of HGP	12	40%

Text Books: Developing Bioinformatics Computer Skills C. Gibas and P. Jamback.

Reference Books:

- Bioinformatics A machine learning approach P. Baldi & S. Brunak
- Bioinformatics: A Practical guide to the analysis oflienes and Proteins A. D. Bzxevanis and B. F. F. Onellette
- Bioinformatics Methods and protocols: Methods inmolecular biology Vol. 132:S. Misenes and S. A. Krawetz (Eds

List of Open Source Software/learning website: https://www.youtube.com/watch?v=lhU3CzslFqw

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	**Discuss** the history and scope of bioinformatics.	2 Understanding
CLO2	**List** the types of DNA and Protein Database.	1 Remembering
CLO3	Enabling students to understand Proteomics, Genomics and Transcriptomics	2 Understanding,
CLO4	Development of capacity to understand 2D Gel Electrophoresis, SAGE	3 Applying, 2 Understanding
CLO5	Learn about Human Genome project	5,3, 4 Evaluate,Applying, Analyze
CLO6	**Discuss** the mechanisms of submitting data to the database.	6 Creating

Mapping of CLOs with Pos & PSOs

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CLO1	H	H	M	M	H	H	H	M	H		L	H	M	M	H
CLO2	M	M			L	H	H	H	L		M			L	
CLO3	M	H	M				M	M	H	L		H	L		M
CLO4	H	H	L	M	H			L	M	M	H	L	M	M	
CLO5	M	L	M	M	M	H	L	M		M	H	H	M	M	H
CLO6	M	M	M		M	M	L	M	M	L	H	M			M

H: High, M:Medium, L:Low