Program Structure

of

B.Sc. (Hons. with Research) Bioinformatics

Summary of Credits

Course Category	For 3 years Program	For 4 years Program
Discipline Core Courses	69	69
Discipline Specific Electives (DSE)	-	16
Generic Electives	24	32
Multi-Disciplinary Courses (MDC)	12	12
Ability Enhancement Courses (AEC)	8	8
Skill Enhancement Courses (SEC)	10	10
Value Added Courses (VAC)	7	7
Industrial/Academic Internship	2	2
Dissertation	NA	12
Total Credits	**132**	**168**

B.Sc. (H) Bioinformatics

Curriculum Structure

SEMESTER I							
S. No	**Course Code**	**Course Name**	**Category of Course**	**L**	**T**	**P**	**Credits**
1.		Basics of Cell Biology	Discipline Core Course-1	3	0	1	4
2.		Concepts of Biochemistry	Discipline Core Course-2	4	0	0	4
3.		Introduction to Bioinformatics and Biological Databases	Discipline Core Course-3	3	0	1	4
4.		Generic Elective (Chemistry/Biodiversity and Conservation/Clinical Science/Forensic Science/Sustainability)	Generic Elective - 1				4
5.		Ecology and Environment	Ability Enhancement course-1	2	0	0	2
1.		Essentials of IT Tools	Skill Enhancement Course- 1	1	0	1	2
2.		Food Nutrition and Hygiene/	Value Added Course-1	2	0	0	2
			TOTAL				22
SEMESTER II							
S. No.	**Course Code**	**Course Name**	**Category of Course**	**L**	**T**	**P**	**Credits**
1.		Python for Biological Data Analysis.	Discipline Core Course-4	3	0	1	4
2.		Basic Principles of Genetics	Discipline Core Course-5	3	0	1	4
3.		Essentials of Molecular Biology	Discipline Core Course-6	3	0	1	4
4.		Generic Elective (Chemistry/Biodiversity and Conservation/Clinical Science/Forensic Science/Sustainability)	Generic Elective - 2				4

5.		Logical communication	Ability Enhancement Course-2	2	0	0	2
6.		Mathematics for Biosciences	Skill Enhancement Course- 2	2	0	0	2
7.		Biostatistics for Biological Data Analysis	Value Added Course-2	2	0	0	2
			TOTAL				22
SEMESTER III							
S. No.	**Course Code**	**Course Name**	**Category of Course**	**L**	**T**	**P**	**Credits**
1.		Introduction to Omics Studies	Discipline Core Course-7	3	0	1	4
2.		R Programming	Discipline Core Course 8	3	0	1	4
3.		Essentials of Unix Command Line	Discipline Core Course-9	2	0	1	3
4.		Generic Elective (Chemistry/Biodiversity and Conservation/Clinical Science/Forensic Science/Sustainability)	Generic Elective – 3				4
5.		Bioinstrumentation and Biotechniques	Multi Disciplinary Course- 1	4	0	0	4
6.		Critical Thinking & Writing	Ability Enhancement Course-3	2	0	0	2
7.		Fundamentals of Computational Biology	Skill Enhancement Course- 3	2	0	0	2
			TOTAL				23
SEMESTER IV							
S. No.	**Course Code**	**Course Name**	**Category of Course**	**L**	**T**	**P**	**Credits**
1.		Immunology: Concepts and Applications	Discipline Core Course-10	3	0	1	4
2.		Biotechnology & Genetic Engineering	Discipline Core Course-11	3	0	1	4
3.		Genomics and Proteomics	Discipline Core Course-12	3	0	1	4
4.		Generic Elective (Chemistry/Biodiversity	Generic Elective – 4				4

		and Conservation/Clinical Science/Forensic Science/Sustainability)					
5.		Cyber Sphere and Security Global Concern	Ability Enhancement Course- 4	2	0	0	2
6.		NSS/NCC/Social Internship	Value Added Course-3	2	0	0	2
7.		Molecular Modelling and Computer Aided Drug Design	Multi-Disciplinary Course- 2	2	0	2	4
			TOTAL				24
SEMESTER V							
S. No.	**Course Code**	**Course Name**	**Category of Course**	**L**	**T**	**P**	**Credits**
1.		Immunoinformatics	Discipline Core Course-13	3	0	1	4
2.		Bioinformatics for Translational Medicine	Discipline Core Course-14	3	0	1	4
3.		Basics of Version Control with Git	Skill Enhancement Course- 4	1	0	1	2
4.		Research Methodology and Ethics	Multi-Disciplinary Course- 3	4	0	0	4
5.		Generic Elective (Chemistry/Biodiversity and Conservation/Clinical Science/Forensic Science/Sustainability)	Generic Elective – 5				4
6.		Internship	Industrial/Academic Internship				2
			TOTAL				20
SEMESTER VI							
S. No.	**Course Code**	**Course Name**	**Category of Course**	**L**	**T**	**P**	**Credits**
1.		Molecular Phylogenetics and Evolution	Discipline Core Course-15	3	0	1	4
2.		Biological Data Analytics	Discipline Core Course-16	3	0	1	4
3.		Cheminformatics	Discipline Core Course-17	3	0	0	3

4.		Pharmacogenetics and Pharmacogenomics	Discipline Core Course-18	3	0	1	4
5.		Generic Elective (Chemistry/Biodiversity and Conservation/Clinical Science/Forensic Science/Sustainability)	Generic Elective - 6				4
6.		AI in Bioscience and Technology	Skill Enhancement Course- 5	1	0	1	2
			TOTAL				21
After 3 years, Students will get the degree of B.Sc. (Hons.) Bioinformatics with Total Credits=132							
SEMESTER VII							
S. No.	**Course Code**	**Course Name**	**Category of Course**	**L**	**T**	**P**	**Credits**
1.		Discipline Specific Elective- 1	DSE- 1	3	0	1	4
2.		Discipline Specific Elective- 2	DSE- 2	3	0	1	4
3.		Discipline Specific Elective- 3	DSE- 3	3	0	1	4
4.		Generic Elective (Chemistry/Biodiversity and Conservation/Clinical Science/Forensic Science/Sustainability)/Minor Project	Generic Elective - 7				4
5.		Generic Elective (Chemistry/Biodiversity and Conservation/Clinical Science/Forensic Science/Sustainability)	Generic Elective - 8				4
			TOTAL				24
SEMESTER VIII							
S. No.	**Course Code**	**Course Name**	**Category of Course**	**L**	**T**	**P**	**Credits**
1.		Dissertation	Dissertation				12
			TOTAL				12
After 4 years, Students will get the degree of B.Sc. (Hons. with Research) Biocinformatics with Total Credits=168							

List of Discipline Specific Electives (DSE)

Medical Biochemistry Specialization

Category of Course	Subject	L	T	P	Credits
Elective-1	Clinical correlations of disease	3	0	1	4
Elective-2	Genetic disorders	4	0	0	4
Elective-3	Cancer Biology	4	0	0	4
Elective-4	Epigenetics and Chromatin Biology	4	0	0	4

Advanced Bioinformatics Specialization

Category of Course	Subject	L	T	P	Credits
Elective-1	Algorithms in Computational Biology	3	0	1	4
Elective-2	Machine Learning in Computational Biology	3	0	1	4
Elective-3	Structural Bioinformatics	3	0	1	4

Biotechnology Specialization

Category of Course	Subject	L	T	P	Credits
Elective-1	Ecological Biotechnology	3	0	1	4
Elective-2	Food Biotechnology	3	0	1	4
Elective-3	Industrial Biotechnology	3	0	1	4
Elective-4	Enzyme Technology	3	0	1	4