

**JIS Institute of Advanced Studies and Research Kolkata**  
**Centre for Health Science and Technology**  
**Syllabus for M.Tech. Bioinformatics**  
**(academic year 2019-20 onwards)**

**SEMESTER 1**

Theory courses will include practical modules as necessary.

Sl.No	Course Title	Credits
1	Introduction to Bioinformatics	3
2	Cell and Molecular Biology	3
3	Molecular Evolution	2
4	Molecular and Cellular Biophysics	3
5	Structural Bioinformatics	2
6	Mathematics and Statistics in Biology	4
7	<b>LAB:</b> R Programming for Bioinformatics	2
8	<b>LAB:</b> Programming Concepts – PERL, PYTHON	3
9	<b>Research Methodology</b>	3

**SEMESTER 2**

Theory courses will include practical modules as necessary.

Sl.No	Course Title	Credits
1	Phylogenetics	3
2	Introductory Microbiology and Immunology	3
3	Metagenomics and Microbiome	2
4	Human Genetics and Genomics	3
5	Proteomics and Metabolomics	2
6	Pharmacoinformatics	3
7	<b>LAB:</b> Advanced Programming – PERL, PYTHON, JAVA	3
8	<b>LAB:</b> Database Design	3
9	<b>Research Methodology</b>	3

**SUMMER BREAK: Summer Internship** (optional)

**SEMESTER 3**

Theory courses will include practical modules as necessary.

Sl.No	Course Title	Credits
1	Systems Biology and Biological Networks	3
2	Next-generation Sequencing Data Analysis	3
3	Molecular Dynamics Simulation and Docking	3
4	Medical Genomics and Computer-aided Drug Design	3
5	Machine Learning and Data Mining	3
6	Big Data in Bioinformatics	3
7	Career Development and Business	2
8	Intellectual Property Rights	2
9	<b>Research Methodology</b>	3

**SEMESTER 4**

<b>Sl.No</b>	<b>Course Title</b>	<b>Credits</b>
1	<b>PROJECT:</b> Thesis with Oral Presentation	10