

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

**SEMESTER 1**

Sl.No	Course*	Credits
1	Introduction to Bioinformatics	3
2	Cell and Molecular Biology	2
3	Biochemistry of Macromolecules	2
4	Structural Bioinformatics	2
5	Mathematics and Statistics in Biology	4
6	Programming for Bioinformatics – PERL, PHYTHON, R	3
7	LAB: Biochemistry and Molecular Biology	3
8	LAB: Programming Concepts – PERL, PYTHON, R	3
9	Research Methodology	3
<b>Total</b>		<b>25</b>

**SEMESTER 2**

Sl.No	Course*	Credits
1	Phylogenetics and Evolution of Virulence & Drug Resistance	3
2	Medical Microbiology and Immunology	3
3	Metagenomics and Microbiome	2
4	Genetics and Transcriptomics	3
5	Proteomics and Metabolomics	2
6	Big Data in Bioinformatics	3
7	LAB: Medical Microbiology and Immunology	3
8	LAB: Database Design	3
9	Research Methodology	3
<b>Total</b>		<b>25</b>

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

**SEMESTER 3**

Sl.No	Course*	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	Genetic Engineering and Synthetic Biology	3
6	Pharmacoinformatics	3
7	Career Development and Entrepreneurship	2
8	Biosafety, Bioethics & Intellectual Property Rights	2
9	Research Methodology	3
<b>Total</b>		<b>25</b>

**SEMESTER 4**

Sl.No	Course	Credits
1	Project: Thesis with Oral Presentation	10

\* Any of the theory courses may include practical modules as necessary.