

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

**SEMESTER 1**

<b>Course Code</b>	<b>Course*</b>	<b>Credits</b>
PGBIF101	Introduction to Bioinformatics	3
PGBIF102	Cell and Molecular Biology	2
PGBIF103	Molecular Evolution	2
PGBIF104	Molecular and Cellular Biophysics	3
PGBIF105	Structural Bioinformatics	3
PGBIF106	Probability and Statistics	3
PGBIF107	Programming (Theory) – PHYTHON, R, JAVA	2
PGBIF191	Programming (Lab) – PHYTHON, R, JAVA	4
PGBIF108	Research Methodology	3
<b>Total</b>		<b>25</b>

**SEMESTER 2**

<b>Course Code</b>	<b>Course*</b>	<b>Credits</b>
PGBIF201	Phylogenetics and Evolution of Virulence & Drug Resistance	3
PGBIF202	Introductory Microbiology and Immunology	3
PGBIF203	Metagenomics and Microbiome	2
PGBIF204	Human Genetics and Genomics	3
PGBIF205	Proteomics and Metabolomics	2
PGBIF206	Molecular Dynamics Simulation and Docking	3
PGBIF207	LAB: Programming – PERL, JAVA	3
PGBIF291	LAB: Database Design	3
PGBIF208	Research Methodology	3
<b>Total</b>		<b>25</b>

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

**SEMESTER 3**

<b>Course Code</b>	<b>Course*</b>	<b>Credits</b>
PGBIF301	Systems Biology and Biological Networks	3
PGBIF302	Next-generation Sequencing Data Analysis	3
PGBIF303	Big Data in Bioinformatics	3
PGBIF304	Medical Genomics and Computer-aided Drug Design	3
PGBIF305	Machine Learning and Data Mining	3
PGBIF306	Pharmacoinformatics	3
PGBIF307	Career Development and Entrepreneurship	2
PGBIF308	Intellectual Property Rights	2
PGBIF309	Research Methodology	3
<b>Total</b>		<b>25</b>

**SEMESTER 4**

<b>Course Code</b>	<b>Course</b>	<b>Credits</b>
PGBIF401	Project: Thesis with Oral Presentation	10

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