

JAWAHARLAL NEHRU UNIVERSITY

School of Computational and Integrative Sciences

Course Structure

Master of Science (M. Sc.)

Computational and Integrative Sciences

1st Semester

1 st Semester	Course title	Credits	
		CB	CS
IT401	Mathematics-I	3	
IT402	Introduction to Probability and Statistics	3	
IT403N	Programming Fundamentals and Data Structure	3	
IT601N	Programming in R and Python	3	
	Elective 1	3	
	Elective 2	3	
IT427	Laboratory-I	6	
Total Credits		24	

Elective Courses (choose any 2)

- IT404N Fundamentals of Physical Sciences
- IT405N Fundamentals of Biological Sciences
- IT524 Fundamentals of Bioinformatics
- IT525 Fundamentals of Chemistry

Post Graduate Diploma in Biological Big Data Analytics

1st Semester

		Credits
IT601N	Programming in R and Python	3
IT602	Data Analytics and Modeling	3
IT603	Data Warehousing and Integration	3
IT604	Molecular Modeling and Simulation	3
IT605	Genomic data analytics	3
IT606	Social networks and epidemiology	3
IT607	Personalized medicine, health and clinical trials	3

Course Structure

Computational and Integrative Sciences (Ph.D.)

	Course title	Credits	Faculty In-charge
	Elective 1*	3	Concerned Faculty
	Elective 2*	3	Concerned Faculty
IT422	Research Methodology	3	
IT719	Research and Publication Ethics (RPE)	2	
Total		11	

*Two elective courses may be completed over a period of first two semesters after admission in the PhD programme.

Ph.D Elective courses:

IT414	Complex System in Biology
IT715	Computational Biology and Bioinformatics
IT716	Mathematical and Statistical Methods of Bioinformatics
IT717	Algorithms and practical implementation in Bioinformatics
IT763	Advanced Computational Methods for Optimizations (ACMO)
IT764	Stochastic Simulations in Biological Physics
IT765	Computational Biophysics
IT766	Genomics: Concepts, Methods and Applications (GCMA)
IT776	Digraph and Petri nets: Theory and the modeling for systems (DPTMS)
IT770	Neural networks and deep learning for biological data
IT771	Information theory and molecular biology
IT772	Data mining and modeling
IT773	Biomolecular simulation theory and application
IT774	Molecular techniques in genome analysis
IT777	Electromagnetic Applications in Biology
IT778	Agricultural Bioinformatics
IT779	Advanced Applied and Computational Complex Analysis
IT780	Mathematical concepts and Methods for Biological Systems
IT781	Advanced Fluid Dynamics and its applications in Biological Systems
IT783	Genomics Methods and Data Science (GMDS)