

## MS in Computational Biology

### Open Electives:

1. Complex Systems in Biology
2. Intelligent Systems in Biology
3. Signals and Systems in Biology
4. Bioinformatics: Sequences, Structures and Systems

### MSc 1<sup>st</sup> Semester Courses

Course Code	Course Title	Credits
IT401	Mathematics-I	3
IT402	Introduction to Probability and Statistics	3
IT403	Programming Fundamentals and Data Structure	4
IT404	Fundamentals of Physical Sciences	4
IT405	Fundamentals of Biological Sciences	4

### MSc 2<sup>nd</sup> Semester Courses

Course Code	Course Title	Credits
IT411	Mathematics-II	3
IT412	Topics in Statistics and Linear Algebra	3
IT413	Advanced Topics in Physical Sciences	3
IT414	Complex Systems in Biology	3
IT415	Graphs, Networks and Concepts of Systems Sciences	3
IT416	Computer Programming and Simulations Laboratory	3

### MSc 3<sup>rd</sup> Semester Courses

Course Code	Course Title	Credits
IT451	Computational Structure Biology	4
IT452	Statistical Mechanics of Biomolecules: Theory and simulation	4

IT453	Biological Sequence Analysis and Algorithms	4
IT421	Numerical Techniques and Programming Lab	3
IT422	Research Methodology	3
IT454	Computational Structure Biology	4
IT455	Statistical Mechanics of Biomolecules: Theory and simulation	4
IT756	Non Linear Dynamics	3

### Elective Courses

IT762	Chemoinformatics in drug designing (Chemoinformatics)	3
IT763	Advanced computational optimization techniques (ACOT)	4
IT764	Stochastic Simulations in Biological Physics (SSBP)	3
IT765	Computational Biophysics (CBB)	3
IT766	Genomics : Concepts, Methods and Applications (GCMA)	3
IT767	Computational systems biology (Sysbio)	3
IT768	Omics Sciences	3
IT769	Graph theory, Petri nets and Modeling for Biological Systems (GPMBS)	4
IT770	Neural Networks and deep learning for biological data	2
IT771	Information theory and molecular biology (ITMB)	3
IT772	Data mining and modeling (DMM)	3
IT773	Biomolecular simulation theory and applications (BioSimulation)	3
IT774	Molecular Techniques in genome analysis (MTGA)	3

The syllabus can be viewed from the website of SCIS, JNU

(<http://jnu.ac.in/scis>)