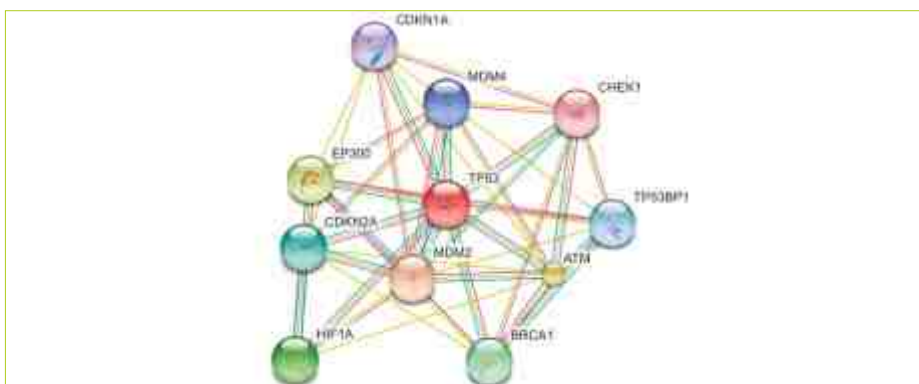


MS IN BIOTECHNOLOGY WITH SPECIALIZATION IN BIOINFORMATICS (MSBOI)

2 years, full-time and residential



FOCUS AREAS

- ▶ Computational and Systems Biology
- ▶ Computational Proteomics
- ▶ Computational Genomics and Assembly
- ▶ Gene Expression Profiling
- ▶ Biological data modelling, warehousing, and data mining technologies

With the advent of high through-put technologies like Microarrays and NextGen sequencing, 21st century biology has lead to data explosion. These technologies output stupendous amount of data in single experiment. With the use of these technologies comes the huge challenge of collecting, storing and analysis of data. The challenge for Bioinformatics is to capture, model, integrate and analyze this data in a consistent way to provide new and deeper insights into complex biological systems. The technical side of the bioinformatics includes issues such as programming, algorithm design, data storage and mining protocols, integrating databases, systems biology, but all the time intimately integrated with biological problems. There is a great need for trained bioinformatics resources who can handle the 21st century biological informatics challenges. The bioinformatics industry is expected to grow at 15% on annual basis and hence there is great requirement of well trained human resource in Bioinformatics. The DBT, Govt. of India, is also providing huge funds for R&D in biotechnology and bioinformatics. The stage has been reached now where you can not do biotechnology without help of bioinformatics. In most of universities in India, bioinformatics has been introduced as a separate subject module which is integrated into majority of life science undergraduate courses. This just proves how inevitable Bioinformatics has become.

The objective of this program is to craft best human resources in the emerging field of bioinformatics who will be needed to carry out research and development work. The program aims to deliver the best of knowledge based training on understanding the biological systems and modeling them, creating informatics solutions for supporting the medical staff in generating patient specific gene/protein expression profiling for diagnostic and therapeutic purposes. This unique program will provide the students an opportunity to work in specialized labs in government as well as private institutes and industries, in clinical research and trials after successfully completing the program. This program will expose the students to basic and applied aspects of bioinformatics like systems biology, computational biology, genomics and proteomics. The course brings them to a level of understanding whereby they realize the importance of learning to a scientific application. To attain this goal, we will use a combined approach involving lectures, journal club discussions, oral presentations and exposure to research work in the laboratory.

ELIGIBILITY

Bachelors or Masters Degree in Biotechnology and Bioinformatics, in any branch of Life Sciences, Medical Sciences, Pharmaceutical Sciences, Chemical Sciences, Physical Sciences, Engineering and Technology or equivalent (with minimum 55 percent marks or equivalent grades).

MS IN BIOTECHNOLOGY WITH SPECIALIZATION IN BIOINFORMATICS (MSBOI)

COURSE STRUCTURE

SEMESTER	CODE	COURSE NAME	CREDITS
SEMESTER I			
	MBOI-001	Molecular and Cell Biology	6
	MBOI-002	Developmental Biology	6
	MBOI-003	Introduction to Systems Biology	6
	MBO-001	Overview of Stem Cells	6
	MBOI-004	Applications of Genomics and Proteomics	6
	MBOI-005	Immunology and Vaccines	6
	MBO-003	Seminar	4
	MIN-001	Life Skills Development I	6
		Total	46
SEMESTER II			
	MBOI-006	Computational Molecular Biology	6
	MBOI-015	Biological Database Design and Implementation	6
	MBOI-016	Biostatistics	6
	MBOI-017	Perl Programming	6
	MBOI-018	Biological Informatics	6
	MBOI-019	Introduction to Object Oriented Programming with JAVA	6
	MIN-002	Life Skills Development II	6
		Total	42
SEMESTER III			
	MBOP-003	Research Project Phase I	36
SEMESTER IV			
	MBOP-004	Research Project Phase II	48
Total Credits			172