

MS IN BIOTECHNOLOGY WITH SPECIALIZATION IN MOLECULAR MEDICINE (MSBOMM)

2 years, full-time and residential



FOCUS AREAS

- ▶ Molecular Biology
- ▶ Molecular basis of human diseases
- ▶ Animal modeling of human diseases
- ▶ Cancer Biology

With the discovery and development of new techniques in Genomics and Proteomics, it is now possible to do the gene and protein expression profiling of healthy versus diseased cells or tissues. It is predicted that in 10-15 years time, we may have a patient specific molecular medicine regimen after looking at the gene and protein expression status of that patient. Besides, when we understand the molecular mechanisms of disease development, it is possible to design a small molecule drug which specifically inhibits the disease or cancer causing proteins. The successful example of this approach is the drug Gleevec (STI571) which is a Kinase inhibitor and is used in the treatment of Chronic Myeloid Leukemia.

The objective of this program is to provide the training in the emerging field of Molecular Medicine and prepare the human resources that will be needed to carry out research and development work, for experiments on animal models of human diseases to discover new drugs, 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, for testing and manufacturing the Molecular Biology based small molecule drugs, in clinical research and trials after successfully completing the program.

This program will expose the students to basic and applied aspects of molecular basis of human diseases, animal modeling of human diseases, and the allied subjects like Molecular Biology and Cancer Biology and bring 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).

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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-004	Seminar	4
	MIN-001	Life Skills Development I	6
		Total	46
SEMESTER II			
	MBOI-006	Computational Molecular Biology	6
	MBOI-007	Embryonic Stem Cells	6
	MBOI-020	Molecular Basis of Human Diseases	6
	MBOI-021	Animal Modeling of Human Diseases	6
	MBOI-022	Cancer Biology	6
	MBOI-023	Analytical Methods for Drug Development	6
	MIN-002	Life Skills Development II	6
		Total	42
SEMESTER III			
	MBOP-005	Research Project Phase I	36
SEMESTER IV			
	MBOP-006	Research Project Phase II	48
Total Credits			172