



# M.Tech. Biotechnology

## Aims and Objectives

- To nurture and train the next generation of students with cutting edge knowledge and skills suitable towards biotechnological research and Bio-industry.

## Academic Curriculum & Courses

M.Tech. in Biotechnology programme at IIT Mandi is intended to nurture and train the students with strong interest in research and Bio-industry to meet the existing challenges of the biomedical research/industry. The curriculum is directed towards fundamental and practical understanding of the core biotechnology areas along with specialized fields in the form of specialization programs in “Systems Biology” and “Medical and Nano-biotechnology”. In addition, elective courses from other disciplines will provide interdisciplinary exposure to the students. The core-subjects, specialized theme areas of Biological Sciences, electives from other schools, hands on laboratory training along with the Thesis project component to be undertaken in-house/ other R&D institutes/ industries will enrich students with right skills required in the current Job market both in academia and industries, on completion of the program. M.Tech in this discipline is divided into two specializations, ie, spcialization in Nanobiotechnology/specialization in Systems Biology.

### Semester 1

- Advanced Cell Biology, Cell Physiology in health and disease.
- Quantitative and computational Biology.
- Cellular Bioprocess Technology.
- Cell Biology and Physiology.
- Computational Biology and Cellular Bioprocess Technology Lab.
- Emerging Energy Sources.
- Nano-manufacturing.

### Semester 2

- Analytical Biotechniques.
- Molecular Biotechnology.
- Analytical and Molecular Biotechnology(Lab)
- IPR and Biosafety.
- Disease Biology
- Cellular fuel and Cellular Communication.
- Nanobiotechnology.
- Metaboloic Systems Biology

## Semester 3<sup>rd</sup>/4<sup>th</sup>

**Project Work:** Students will engage in the thesis work with Institute faculty

**Software and Equipment:** Computational Fluid Dynamics software package ANSYS Fluent, Fluorescence Microscope, Confocal Microscope, Fluorescence Spectroscopy, UV-Visible Spectroscopy, Scanning Electron Microscope, Sonicator, Centrifuge, Gel doc, SDS-PAGE unit, Real time PCR instrument, Spectrophotometer, Schrodinger software, Agarose gel & SDS PAGE gel casting unit, Gel Doc., UV transilluminator, Stopped flow, FPLC akta pure, Nano drop, NMR, GCMS, Bioreactors, SEM, TEM, XRD, Raman Spectroscopy.

## Achievements

- Khorana programme Indo-US fellowship received by 2 students (2016 and 2017 batch)
- Khorana programme Indo-US fellowship supported Jointly by Dept. of Biotechnology, Govt. of India, Indo-U.S Science and Technology forum (IUSSTF) and WINstep Forward

## Associated Faculty

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