



Placement Brochure 2023-2024

**School of Biosciences and Bioengineering
Indian Institute of Technology Mandi**





Chair's Message

Dr. Shyam Kr. Masakapalli, (Chairperson, SBB IIT Mandi)

School of Biosciences and Bioengineering (SBB), IIT Mandi since 2016 is focused on teaching and cutting edge research in the broad areas of Biotechnology and Bioengineering. The current academic programs being offered are BTech-MTech Dual Degree in Bioengineering, MTech in Biotechnology and PhD in Biosciences and Bioengineering. In a short span of 6 years, more than 100 undergraduate and postgraduate scholars and about 65 PhD scholars benefitted from the programs.

The strength of SBB is its incredibly talented faculty carrying independent research, teaching, designing academic curriculum and imparting hands-on project based learning to scholars. SBB faculty achieved Early Career Research Awards, carried projects of high impact in fundamental and translational research areas, widely published and filed patents. Few faculty also achieved INSA Young Scientists Award, Innovative Young Biotechnologist Award, SERB-STAR Award, and Wellcome Trust-DBT India Alliance Intermediate Fellowship. SBB faculty serve as Associate editors, editorial board members and founding members of various scientific journals and academic societies. Our faculty contributed to projects of national and international relevance such as Indo-UK, Indo-US, Indo-German, Indo-Russia, Indo-Danish, IMPRINT Health and Energy, FarmerZone etc.

The high-quality research training and education to the next generation of scholars is successfully catering to the needs of the industries and academia eventually contributing to the Nation Building. Our Alumni started contributing in academia and industries nationally and internationally.

About the course

The Biosciences and Biotechnologies (BioX) at IIT Mandi is motivated by the needs in the field of human healthcare, food/agriculture, and environment sustainability in terms of development of new technologies for better disease diagnosis and management, identification and development of rare medicinally important molecules from various sources, and to clean and protect environment. Being present in the Himalayas, it aims to utilize the diverse resources easily available in the region to fulfil the above-mentioned goals. Motivated by the goals, IIT Mandi is committed to intensify academic teaching, research and development in several areas of BioX. M. Tech in Biotechnology programme is mainly initiated with the goal to train the next generation of students with cutting edge knowledge and skills suitable towards biotechnological research and Bio-industry needs such as biomedical/biopharma etc. The curriculum of M.Tech in Biotechnology programme at IIT Mandi is directed towards fundamental and practical understanding of the core biotechnology areas along with specialized fields in "Systems Biology" and "Medical and Nano-biotechnology". In addition, elective courses from other disciplines provide interdisciplinary exposure to the students. The core-subjects, specialized theme areas of BioX, 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.

Course Structure



Semester I

- Advance cell biology & lab
- Cell physiology & lab
- Quantitative and computational biology & lab
- Cellular bioprocess technology & lab
- 2 free electives



Semester II

- Analytical biotechniques lab
- Molecular biology & lab
- Specialization basket
- Research Methodology
- IPR & Biosafety



Semester III

- M.Tech Project-1
- Seminar



Semester IV

- M.Tech Project-2

Specialization Basket

System Biology



- Metabolic System Biology & lab
- Proteomics & lab
- Metagenomic and Next-generation sequencing methods & lab

Medical & Nanobiotechnology



- Cellular fuel and cellular communication & lab
- Disease biology & lab
- Nano-biotechnology & lab

Faculties of SBB

Dr. Amit Jaiswal



Dr. Amit Prasad



Dr. Baskar Bakthavachalu



Dr. Prasad Kasturi



Dr. Prosenjit Mondal



Dr. Rajanish Giri



Dr. Shyam K. Masakapalli



Dr. Sumit Murab



Dr. Tulika Srivastava



Dr. Trayambak Basak



Research Themes @ BioX Centre

- High-throughput phenotyping in agriculture
- Systems analysis of important crop pathogens for management

Agricultural practices with respect to the Himalayan region

Disease Prevention and Affordable Health Care

Himalayan Biodiversity exploration for biotechnological applications

- Natural Products Biotechnology For Health and Industry

- Biomedical Devices & Instrumentation
- Biomechanics
- Biomedical imaging
- Nanobiotechnology
- Biomaterials
- Diagnostics and Therapy for Diseases

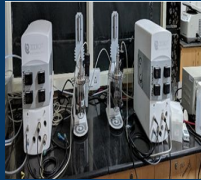
- Exploration of Novel microbes (enzymes) in extreme environments for industrial and biotechnological applications

Facilities at BioX Centre

Cell and Tissue culture Facilities



Next Generation Sequencing Facility



Bioreactor



Gas Chromatography (Mass Spec)

Flow cytometer



And much more : <https://www.iitmandi.ac.in/research/biox/infrastructure.php>

- Molecular biology and genetic engineering techniques
- Biochemical techniques
- Bioanalytical techniques
- Microbiological techniques
- Immunological techniques
- Bioprocess Technology
- Nanomaterial synthesis and characterization
- 3D printing
- Microfluidics
- Programming languages: Perl, Python, C and R script
- OS: Window, Linux, and Bash scripting

Technical skills

Silicon level

- NGS data analysis
- Omics data analysis (Metabolomics, Proteomics, Genomics)
- Mass spectrometry data analysis
- Bioinformatics, databases and softwares.
- MD simulations
- Statistical analysis

Skill Set

- Cell lines
- Mice
- *C.elegans*
- *Drosophila*
- Bacteria
- Fungi
- Rabbit

Handled Model organism

Soft skills

- Research aptitude
- Team work
- Communication
- Project management
- Time management

Students' Projects

Prithvi S Prabhu: Computational analysis of molecular mimicry in autoimmune diseases



Aishwarya Kaur: Precise nanomedicine: Tailored Nanoparticle synthesis for advance diagnostics, therapeutical, and drug delivery.



Santanu Saha: Drug delivery using Covalent Organic Framework (COF)



Sara Hasan: Biofuels, bioprocessing, cell culture, hybrid bioinorganic systems



Ananya Gautam: Environmental Pollutant biodegradation



Nandini Samudre: 3D Bioprinting, surface modified 3D printed bone implant.



Nandini Samudre: Microfluidics and Biocomposite 3D printed orthopaedic implants.



Shiwani Chaubey: Microfluidic device fabrication



Preeti Roy: Monitoring protein aggregation during ageing in *C. elegans*



Priya Rathore: Rescue of metabolic disorder. Western blot, GTT,ITT.



Aarya Suthar: Rescue of metabolic disorder(Diabetes); Western Blot and GTT, ITT



Abhijit Nayek: Microbial kinetics of biocementation relevant microbes/ Studying antimicrobial properties in soil contaminations



Yogesh Pandey: Investigating cellular metabolism under stress using Molecular and Systems Biology based approaches.



Shubhangi Saini: Molecular dynamics simulations to understand the culprit biomolecular interactions in host and CoVID 19.



Contact Us

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