

# Biological Science & Bioengineering

Indian Institute of Technology,  
Kanpur

Placement Brochure  
2019-2020



# Introduction

The department is engaged in cutting-edge research and training in basic biology, biomedical and bioengineering fields. Its aim is to produce quality professionals in modern biology and allied fields who will engage in addressing country's challenges by advancing the discovery in biology. Our faculty and students come from a range of science and engineering disciplines and work in challenging problems that transcend the boundaries of science, engineering and medicine.

The department currently offers four academic programs; B. Tech, B.Tech-M.Tech Dual, M. Tech and PhD in biological sciences & bioengineering.

There are 16 faculty members and about 100 postgraduate (75 PhD. and 25 M. Tech.) and 145 undergraduate students.

For more info please visit department website: <http://www.iitk.ac.in/bsbe/>

# Students

**Undergraduate Program B.Tech, B.Tech-M.Tech Dual :** Admission to the B. Tech program is through the joint entrance examination (JEE) conducted by the IITs. The curriculum aims to expose students to exciting new fields of knowledge while also providing opportunities for obtaining valuable hands-on research experience. The program provides a unique fusion of biology with other basic and engineering sciences. Undergraduate students compete for scholarships and R&D internship in Biotech/Biopharma industries under the auspices of endowment funds established by IITK alumni.

**M. Tech (2 years) :** M. Tech program supported by Department of Biotechnology (DBT), Govt. of India meets a variety of career objectives in research and industry. The program is for four semesters of which three semesters involve hands-on training and research. Admission to M.Tech program is through GATE exam conducted by IITs followed by department written test and interviews.

**Doctor of Philosophy (PhD) :** Excellence in research apart, the program envisages comprehensive development of students for leadership in science and engineering in both industry and academia. Therefore, the PhD program involves intense course work covering diverse areas of biology and bioengineering for competence in both in analytical and quantitative skills.



# Curriculum

## B. TECH AND B. TECH – M. TECH DUAL

1st year Basic Sciences  
2nd year Engineering Sciences and projects  
3rd year Compulsory topics, electives and Summer Internships, Undergraduate Project in a Professors Laboratory  
4th year (and 5th year for Dual)  
Compulsory topics, electives and Thesis

### ELECTIVES

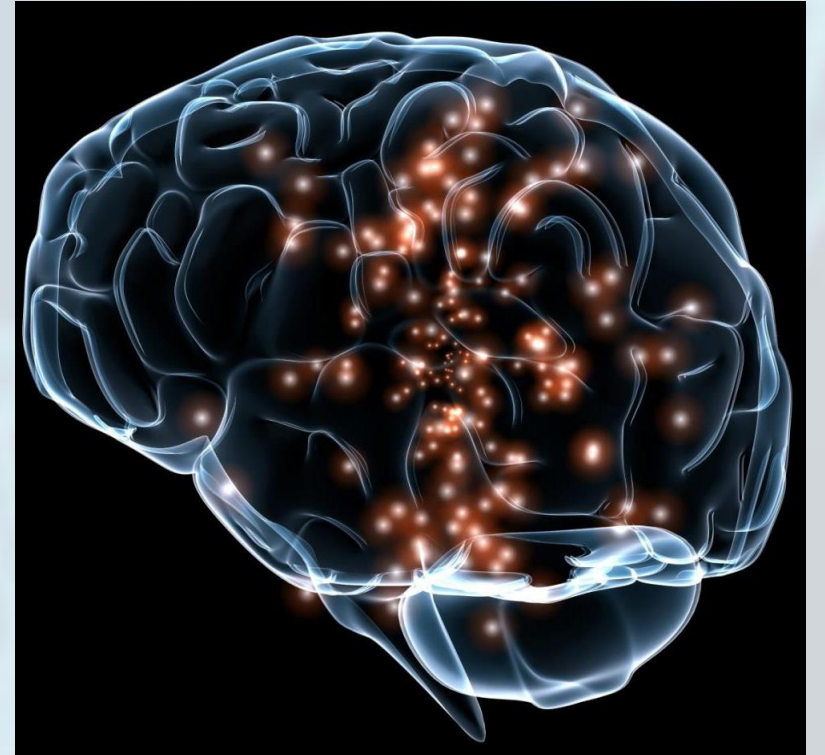
Electives in the department include a total of 7 open electives in which students take up courses from other departments of Computer Science, Economics, Chemistry, Industrial Management etc.  
Electives also include 3 departmental electives taken from courses in the department itself.  
For list of courses available as electives click [here](#).

## M. TECH

1st Semester- Department course  
2nd-4th Semester- Department seminar and Thesis research work

## PhD

1st year- Advanced courses  
2nd year- Comprehensive and State-of-art exam  
3rd year onwards- Thesis research work



# Courses

## UG ENGINEERING COURSES

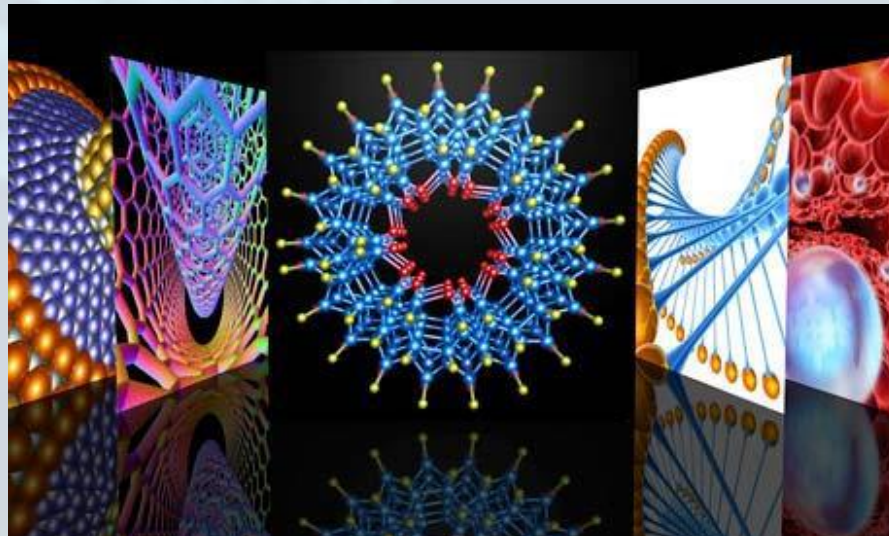
Engineering Physics  
Engineering Mathematics  
Chemistry  
'C' Programming  
Nature and Properties of materials  
Introduction to electronics  
Engineering graphics  
Manufacturing Processes  
Probability and statistics  
Computational methods  
Data Structures and Algorithm

## UG LABORATORY COURSES

Biochemistry and Biochemical engineering  
Biomechanics and Biomaterials  
Structural Biology and Bioinformatics  
Microbiology and molecular biology

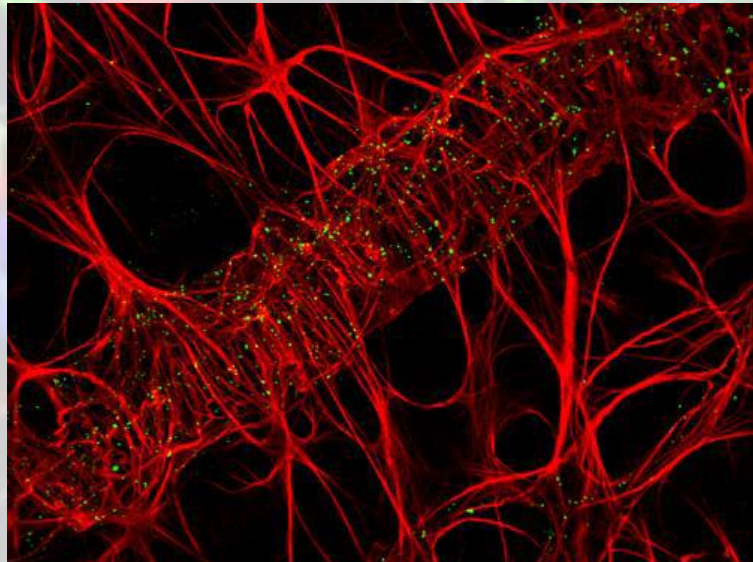
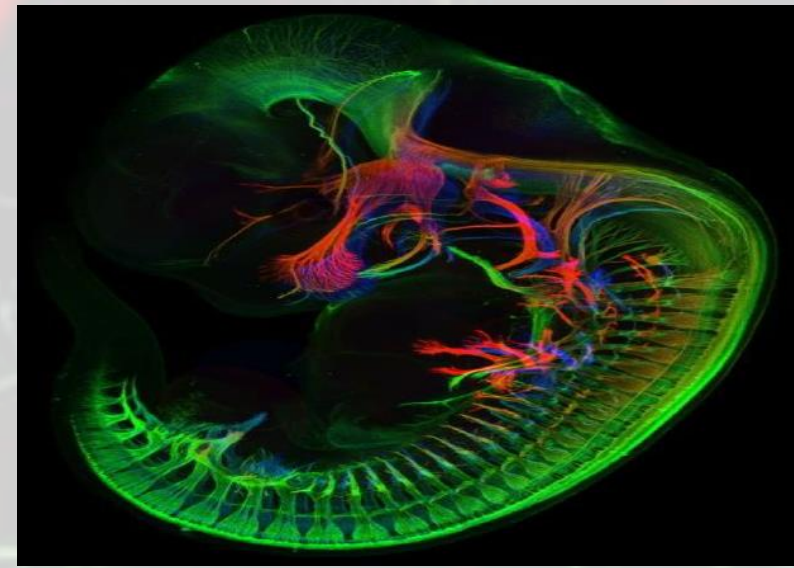
## BSBE DEPARTMENT COURSES

Biopharmaceuticals  
Biochemistry & Structural biology  
Biochemical engineering  
Bioinformatics and Computational biology  
Bioelectricity  
Protein structure & engineering  
Biomaterials  
Tissue engineering  
Biomechanics  
Human molecular genetics  
Functional genomics  
Cell and Molecular biology  
Immunology and Neurobiology  
Developmental Biology  
Physiology  
Instrument methods  
Professional & Scientific communication



# Research

The faculty members are engaged in multi-disciplinary research on cutting-edge problems. Ongoing research projects are spread in broadly three major domains that include (a) molecular, cellular and developmental biology, (b) structural and computational biology and (c) bioengineering. A major emphasis is on understanding the fundamental aspects of cell differentiation and growth, regenerative medicine, elucidating protein structure-function relationship, and engineering approaches to understand complex biological systems.



The department has attracted funding from major national and international agencies including the Wellcome-DBT India Alliance, Indo-UK Science bridge program, UKERI, DBT, DST, CSIR, DAE, ICMR and DRDO to name a few.

# Infrastructure & Research facilities

## **UG/PG Teaching Labs:**

Microscopes, centrifuges, laminar hood, incubators, gel doc system, fermenter, electrophoresis apparatus etc.) for conducting lab courses (microbiology, molecular biology, biochemistry, biochemical engineering and biomaterials) for the undergraduate students (about 100/year).

## **Core facilities:**

Basic facility include Ultra centrifuges, large volume centrifuges, shaker incubators, confocal and fluorescence microscopes, gel doc systems, water purifier, autoclaves, cold rooms, deep freezers.

**Bioinformatics facility:** Servers, Workstations and software modules for high performance computing

**Material characterization facility:** Scanning Electron Microscopy, Rheometer, Fabrication facility, Dynamic light scattering

**Tissue culture and histopathology facility:** culture rooms for cell, organ and virus cultures, tissue processing unit, microtome and cryostat

**Genomic facility:** Affymetrix Microarray facility, DNA Sequencer, Real-time PCR

**Protein purification and characterization facility:** X-ray crystallography facility, scintillation counter, phospho-imager, Circular Dichroism, Fourier Transform Infrared Spectroscopy, High Performance Liquid chromatography, Fast protein liquid chromatography

**Trans genesis Facility:** Transgenic facility for mouse, chicken, Drosophila, C. elegans and zebra fish

**Cell sorting and imaging facility:** Cell sorter, Laser Scanning Confocal Microscope, Live-Imaging equipped Microscope, Fluorescence microscope

# Internships and Past Recruitments

## Undergraduate Internships

### Academic

Massachusetts Institute of Technology  
Caltech  
University of Wisconsin-Madison  
John Hopkins University  
National University of Singapore

### Industrial

Deutsche Bank  
Dr. Reddy's  
Reliance Life Sciences  
Siemens Healthcare  
Care24  
JSW

## Placements

Intas Pharmaceuticals  
Hospira (Pfizer)  
Tata Consultancy Services  
Dr. Reddy's Laboratories  
Strand Life Sciences  
Daiichi-Sankyo  
Cognizant Technologies Solutions  
MBB Labs Private Ltd  
Reliance Jio  
Bain & Company  
BlackRock  
ATCS  
Beehyv  
Citicorp Services  
Indus Insights





# CONTACTS

**Prof. Dharendra S. Katti**

Email: [dsk@iitk.ac.in](mailto:dsk@iitk.ac.in)

Tel: (91) 512-259-4028

Fax: (91) 512-259-4010

**Siddhanta Mhambrey**

Email: [sidpm@iitk.ac.in](mailto:sidpm@iitk.ac.in)

Mb : +917318018969

**Student's Placement Office**

Email: [spo@iitk.ac.in](mailto:spo@iitk.ac.in)

Tel: +91 512 259 44 33

