



**D Y PATIL
INTERNATIONAL
UNIVERSITY
AKURDI PUNE**



**B.Tech.
Bioengineering**

Admission Brochure

2021-22

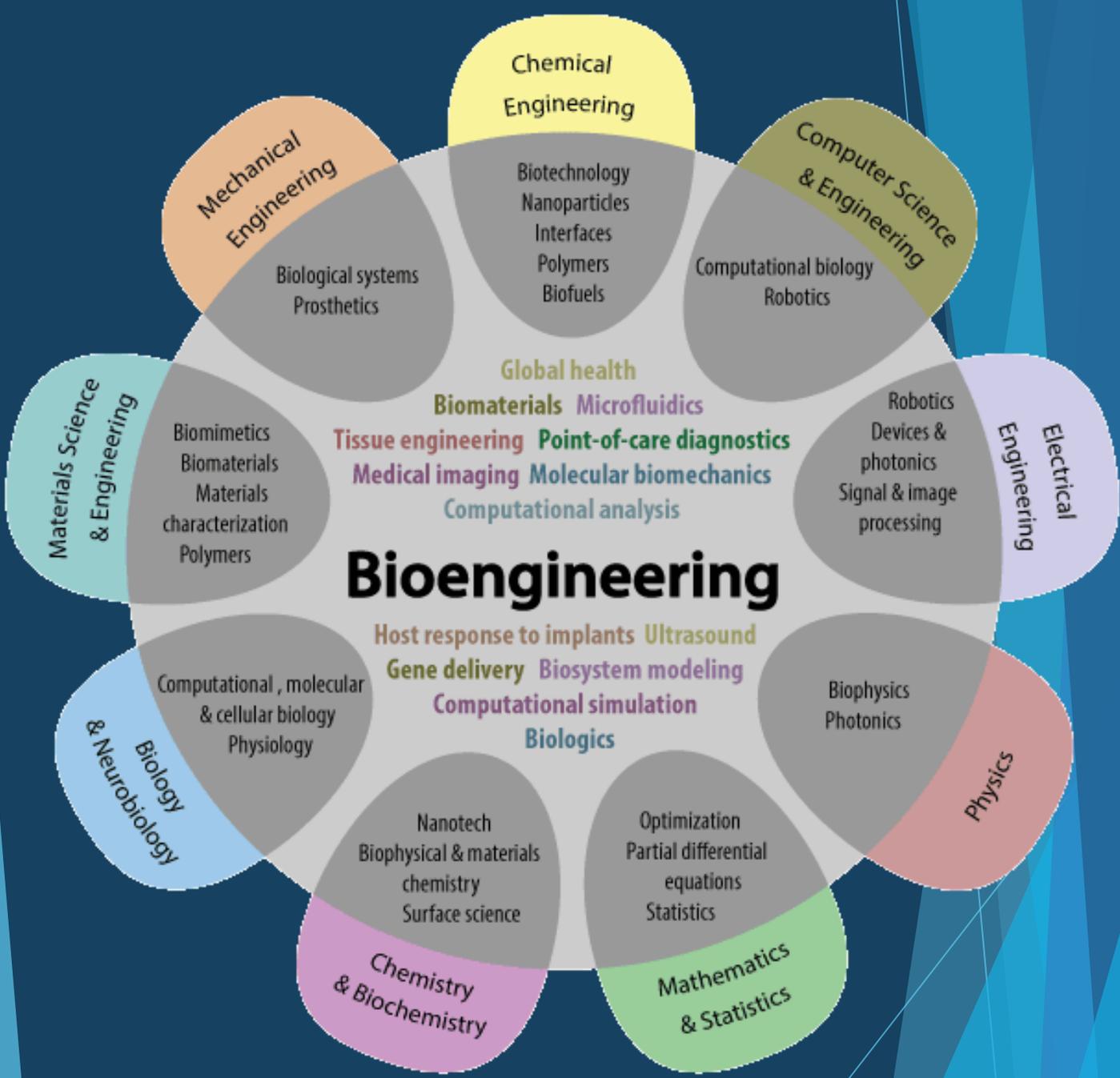
DYPIU is a state private university and has been rolled out with a fundamental mission of covering a remarkable milestone in the history of higher education in India with many accolades. A part of 37 years old organization, it envisions to become a private university of global repute by developing socially relevant and contemporary outcome-based programs, carrying out inter and intradisciplinary research in thrust areas, enhancing the scope of collaborations for research, and boosting faculty and student exchange programs worldwide. Also, by its acute focus on empowerment through education and academic excellence and future-proof academic programs, it aspires to provide an inspirational and experiential learning environment for its stakeholders. DYPIU is also keenly responsive towards serving the prerequisites of the industry and society by embedding internationalization, employability, and value ruminating in all its programs.



Highlights of DYPIU

- ▶ DYPIU is recognized by UGC under section 22 of UGC Act, 1956 and established by the government of Maharashtra under Act No. LXIII of 2017.
- ▶ DYPIU is the First Private State international university to start innovative multiple tracks of specialized courses.
- ▶ DYPIU is a **trend setter** of a multi tracked specialization system for B. Tech. in Computer Science and Engineering, and has been **appreciated by AICTE** and led to change all over country
- ▶ The University is a proud recipient of **Best Academic Innovative Curriculum Award by All India Council of Robotics and Automation.**
- ▶ DYPIU is also proud to be the **Best Private/Deemed University in the New Code of Education 2021 Awards**
- ▶ University has strong industry advisory board
- ▶ DYPIU has strong Industry institute interaction MoU's.
- ▶ DYPIU has Internationally recognized, well qualified & dedicated research oriented faculty





Why choose Bioengineering?

Bioengineering helps to devise innovative solutions to open-ended, unmet challenges in biology, health and medicine. So, the course is right for you, if you are interested in:

- ▶ Developing novel solutions to challenging, real-world problems related health and medicine
- ▶ Innovating tools and devices to improve human lives
- ▶ Employing artificial intelligence equipped quantitative tools, including simulation and mathematical modeling
- ▶ Conducting cutting-edge independent research and design projects (in vitro, in vivo or in silico)
- ▶ Active and experiential learning, through labs, projects and research
- ▶ Acquiring broad knowledge spanning engineering, physical and biological sciences



From Vice Chancellor's Desk

"With launch of innovative multitrack BTech(CSE) in 2019, DYPIU became trendsetter for country. In the same league, we have launched BTech(Bioengineering) in 2020, focusing on current technology trends in this sector and keeping it flexible to accommodate changes happening as we move in future. Pandemic has shown how critical is this program for even survival of human being. I am very excited with the possibilities that this program offers and would also become trendsetter for the country. With highly qualified research focused faculty and plenty of interaction across disciplines, we have already started working on many international projects cutting across domains to solve serious problem that we face today. I invite all potential students to join in this exciting journey and take the challenge of becoming the alchemist of future!"

Prof. Prabhat Ranjan
Vice Chancellor
DYPIU

From Director's Desk

"Today is the age of interdisciplinary sciences, there is no wisdom in remaining confined to isolated niches/islands. We need to collaborate and interact to progress and keep pace with the demands of tomorrow. The bioengineering course has been designed keeping in mind the need of the future. The course aims to train you in the basics of biology, mathematics, physical and engineering sciences to advanced integrated technologies to tackle problems of diagnostics/therapies, advanced pharmaceuticals, food and nutritional sciences and biorobotics."

Prof. Shashi Singh
Director, School of Biosciences and Bioengineering
Dean, Research and Development
DYPIU

Unique Features of the Program

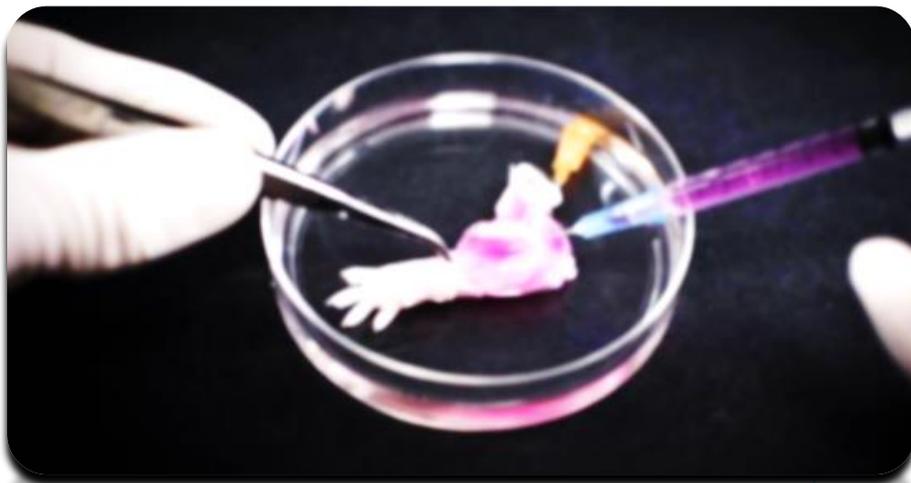
- ▶ **Multi Track Specialization**
- ▶ **Early introduction to Biocomputing using latest tools like Python, MATLAB and R**
- ▶ **Design thinking and Fabrication by realizing Bioengineering design principles in fabrication workshops**
- ▶ **Futuristic Learning by experience**
 - ▶ **Future Proof Curriculum** to prepare the students with the necessary competencies and to become future ready
 - ▶ Program ensures convergence of latest technologies with modern tools
 - ▶ Theoretical knowledge is aided by **highly functional hands-on research and learning laboratories**
 - ▶ **Internships from the first-year summer** intend to solve problems affecting rural/societal/small industry
- ▶ **Technology Commercialization and Entrepreneurship development** in students to motivate them to take challenges, risks and solve problems to become a vital player in the world of innovation and entrepreneurship
- ▶ All faculty members are PhDs from eminent national and international universities like National University of Singapore, IITs and Central Universities of India

MultiTrack B.Tech. Bioengineering Program

To promote a more informed specialisation decisions, DYPIU has taken a futuristic approach and launched innovative programs with multiple track options. The choice of track is made at the end of 2nd year.

B.Tech. Bioengineering is a four year program where foundation courses are taught for 2 and ½ years followed by multi-track specialisation in four emerging technologies:

- ▶ **Biochemical Engineering**
- ▶ **Biomedical Engineering**
- ▶ **Cell and Tissue Engineering**
- ▶ **Food Biotechnology**

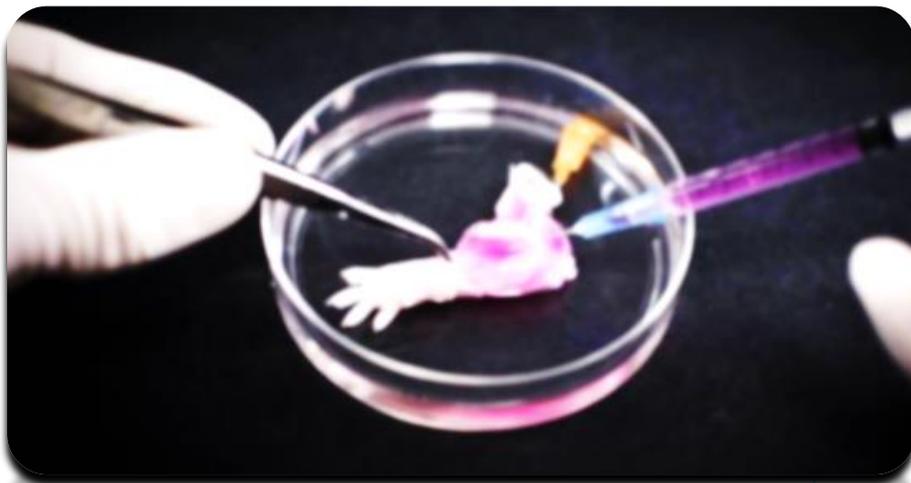


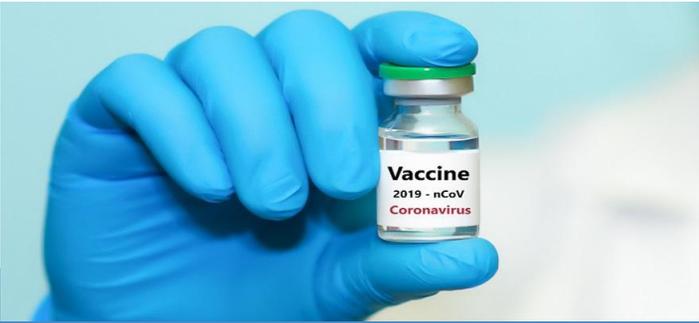
Integrated MTech Bioengineering Program

To provide more flexibility to the students, we also provide an option of a 5 Year integrated program.

Integrated MTech Bioengineering is a five year program where foundation courses are taught for 2 and $\frac{1}{2}$ years followed by specialization courses for 2 and $\frac{1}{2}$ years.

Students will join the course after completing their high school education. At the end of 2 years of the course, they will make a choice between BTech or MTech. At the end of five years of the program, successful students get dual degrees of BTech and MTech.

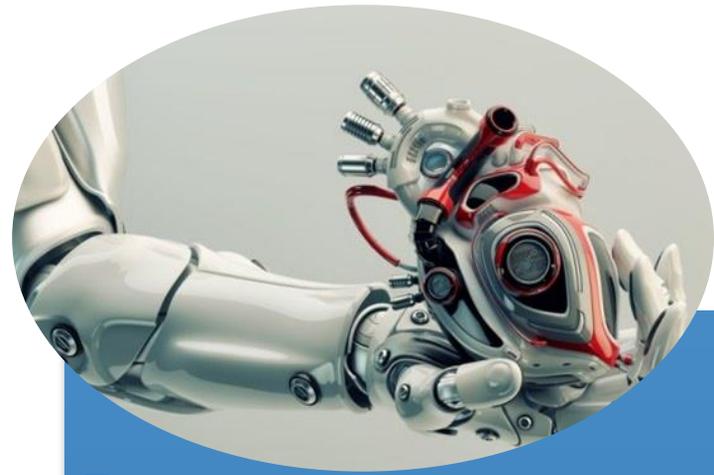




This track aims to prepare engineering minds who can:

- ▶ Design pharmaceutical products using genetic engineering
- ▶ Perform research to develop novel techniques for scaling up production of biological products like proteins and vaccines
- ▶ Collaborate with scientists and other domain experts for the design and implementation of new products and production techniques
- ▶ Find solutions to problems which occur when materials and processes interact with the environment like green manufacturing
- ▶ Provide engineering services to pharmaceutical companies
- ▶ Work in production or maintenance; modify and optimize chemical and pharmaceutical production processes
- ▶ Design and construct chemical and pharmaceutical manufacturing plants



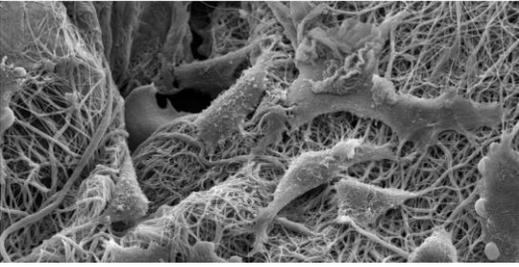


This track aims to prepare engineering minds who can:

- ▶ Design equipment like artificial internal organs, machines which can diagnose medical problems and the replacements for various body parts
- ▶ Design electrical circuits, software to run medical equipment
- ▶ Install, adjust, maintain, repair and provide technical support for biomedical equipment and evaluate their safety
- ▶ Train clinicians and other personnel involved in the operation of biomedical equipment and prepare procedures and technical reports for these equipment
- ▶ Work in coordination with the life scientists, chemists and medical scientists in order to conduct research to find out the engineering aspects of the biological systems of humans and animals like making artificially intelligent bionic limbs



Cell and Tissue Engineering



This track aims to prepare engineering minds who can:

- ▶ Design biocompatible materials engineered as replacements for damaged tissues
- ▶ Design tissue-engineered constructs using biomaterials and genetic engineering to promote desirable cell behavior, leading to enhanced effectiveness inside the body such as scaffolds for artificial skin
- ▶ Work in coordination with the life scientists, chemists and medical scientists in order to conduct research to find out the effective methods of cellular therapy and regenerative medicine including stem cell therapy
- ▶ Design 3D printed organs for transplantation and/or drug testing purposes
- ▶ Use principles of synthetic biology to solve the problems of healthcare
- ▶ Assist doctors and researchers in cellular therapy procedures





This track aims to prepare engineering minds who can:

- ▶ Design processes for food preparation, preservation, and quality management by genetic modification of agricultural produce
- ▶ Create 3D printed and lab produced food products to supplement the agriculture produce and answer the problems of food shortage
- ▶ Develop food safety management and analytical techniques to create sustainable sources of food and food processing techniques
- ▶ Work in coordination with the life scientists, chemists and agriculturists in order to conduct research to find out the engineering aspects of the food processing and management
- ▶ Prepare procedures, technical reports, publish research papers and also make recommendations based on the conducted research and their outcomes



Core Faculty



Prof. Shashi Singh
PhD, University of Delhi
Tissue Engineering

Director, School of Biosciences and Bioengineering
Dean, Research and Development



Dr. Surabhi Sonam
PhD, National University of Singapore
Biomechanical Engineering
Head, Department of Bioengineering



Dr. Ranu Dutta
PhD, University of Allahabad
Nanotechnology
Head, Department of Biosciences



Dr. Sonal Mahajan
PhD, SGBAU Amravati University
Biochemistry



Dr. Meena Pandey
PhD, GBPIHED, Kumaun University
Plant Biotechnology



Dr. Priyatosh Ranjan
PhD, IIT Bombay
Protein Biology



Dr. Sanjay Kumar
IIT Gandhinagar
Nanobiotechnology

Faculty experts of specific subjects related to electronics, computer science, etc are also associated with the university and teach the concerned subjects

Resources

- ▶ Cell Biology Laboratory
- ▶ Microbiology Laboratory
- ▶ Molecular Biology Laboratory
- ▶ Bioinstrumentation Laboratory
- ▶ Biochemistry Laboratory
- ▶ Plant Biotechnology Laboratory
- ▶ NanoBiotechnology Laboratory

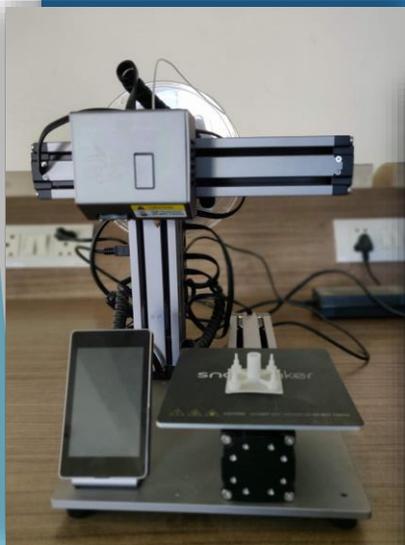
Biosciences Laboratories



Resources

Computing and Fabrication Laboratories

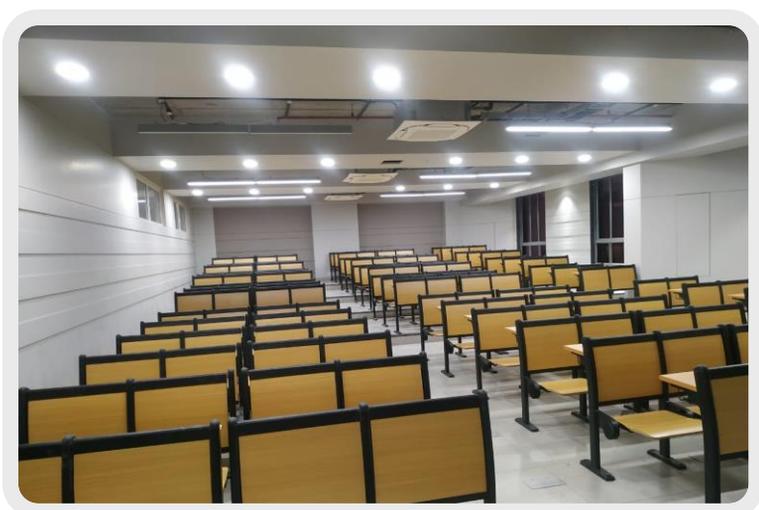
- ▶ Biocomputing Laboratory
- ▶ Online MATLAB Laboratory
- ▶ Python Laboratory
- ▶ Electronics Laboratory
- ▶ Fabrication and Design Thinking Laboratory



Campus Placement

- ▶ 20+ year old Campus Placement Cell
- ▶ 500 Companies registered: 200 Engineering Companies





Eligibility

- ▶ 10+2 with 45% marks in 12th (40% in case of candidates belonging to the reserved category).
- ▶ Compulsory subjects in 12th: Physics, Chemistry and one of the following subjects: Biology, Biotechnology, Mathematics, Technical Vocational Subject, Computer Science, Information Technology, Informatics Practices, Agriculture, Engineering Physics and Business Studies
- ▶ A self-taught bridging course in Mathematics for non-mathematics background students. Aptitude test in Mathematics will be conducted in the beginning of the academic year. Syllabus will be provided once the admission is confirmed. In case of failure, students can take another test at the end of the semester.



Fee Structure

- ▶ Tuition fee - Rs. 97,250/- per semester
- ▶ Registration fee - Rs. 2,500/- per semester
- ▶ Caution Deposit - Rs. 10,000/- (refundable at the end of the program)

Scholarships

Meritorious students are eligible to apply for yearly scholarships:

- ▶ **Incoming Student Scholarship:** Upto 50% for exceptional achievements in JEE or NEET or CBSE (PC+Third Subject)/Any State Board (PC+Third Subject) or MH-CET
- ▶ **Merit-based Yearly Scholarship:** Upto 50% based on previous year's academic performance
- ▶ **Vice Chancellor's Yearly Fellowship:** Upto 50% for students with extraordinary academic achievements at local, national and international levels





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