UNIVRESITY COLLEGE OF ENGINEERING,
ANNA UNIVERSITY- BIT CAMPUS, TIRUCHIRAPPALLI -620024

# PHARMACEUTICAL TECHNOLOGY

**DST-FIST Supported | Centre for Excellence in Nanobio Translational Research**

*Join one of the fastest-growing fields at the intersection of science, technology, and innovation.*

**Programme Offered:**

- B.Tech. Pharmaceutical Technology
- M.Tech. Pharmaceutical Biotechnology
- Research Programme :Ph.D (Full time /Part time )
- MS (By Research)

*"At the Department of Pharmaceutical Technology, we are committed to fostering innovation, scientific curiosity, and practical expertise. Our focus lies in advancing pharmaceutical research and education through a blend of modern infrastructure, expert mentorship, and a collaborative learning environment. We strive to empower future scientists and professionals who will transform global healthcare."*

https://www.aubit.edu.in

# DEPARTMENT OF PHARMACEUTICAL TECHNOLOGY

*Established in 1999, the Department of Pharmaceutical Technology offers a unique blend of pharmaceutical sciences, biotechnology, and engineering.*

**Vision:**

To provide quality education, foster research and development in Pharmaceutical Technology, evolve innovative solutions for industrial problems and serve for humanity, upraise the department to reach the apex of glory in pharma education and research to be cognizant of as Centre for Excellence.

**Misson:**

- Deeply inoculate the treasure of pharmacy education and research into the inquisitorial minds of students through practicing with state of the art infrastructural facilities to instigate the multi-disciplinary expertise to meet the needs of pharmaceutical and allied industries.
- Provide a dynamic educational experience, create outreach opportunities and empower them to become leaders of profession.
- Advocate the responsibility to contribute for the improvement in public health by developing and translating concepts into practice within the state and beyond.

**Programme Educational Objectives:**

- To prepare students for prosperous spectrum of career avenues in academia, advanced research, industries of pharmaceutical technology, biomedicine, biotechnology, law, business and government and other pharmaceutical pursuits through dissemination of knowledge and proficiency in engineering and technology fundamentals related to pharmaceutical technology and the ability to solve problems.
- To transfuse in students the sense of confidence in professional endeavors by application of the derived knowledge and appreciation of economical impact in a societal context.
- To provide collegial and nurturing environment for the students to realize the professional, ethical obligations and their concern to protect the health and welfare of the public, and to be accountable for the social and environmental impact of their practice.
- To create an enjoyable educational environment in which students participate in multi-disciplinary, team oriented, open-ended curricular and co-curricular activities that prepare them to work either individually and as an integrated team member.
- To facilitate the students to gain the wisdom of fundamentals and advances to practice pharmaceutical technology and interdisciplinary research as career of constructive service to society and higher learning.

**Programme Outcomes:**

- After completion of graduation in Pharmaceutical Technology, the students will be able to demonstrate the ability to:
- Apply knowledge of mathematics, science and technology in the discipline.
- Identify, formulate, research literature, and analyse complex engineering problems for its solution.
- Design and develop system processes that meet the specified needs with appropriate consideration for public health, safety, cultural, societal, and environmental.
- Design the experiments, its analysis and interpretation of data, synthesis of the information using research-based knowledge for complex problems.
- Use modern engineering tools, software and equipment to meet the needs in the area of Pharmaceutical Technology.
- Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues relevant to the professional engineering practices.
- Apply knowledge of the impact of pharmaceutical technology solutions in a societal and global context.
- Demonstrate ethical principles and commitment to responsibilities and norms of the Pharmaceutical technology practices.
- Work effectively as an individual and as well as member in teams of diversified professionals.
- Communicate effectively.
- Understand the philosophies of project management principles in Pharmaceutical technology.
- Showcase urge for self-education and life-long learning.

**Programme Specific Objectives:**

- After successful completion of the program the graduate will be able to:
- Develop active pharmaceutical ingredients, drug intermediates and pharmaceutical products.
- Apply data driven decisions and predictive analytical tools in smaller and larger molecule producing industries.
- Identify technical issues related to the design, manufacturing of chemicals & pharmaceuticals and provide effective interdisciplinary solutions.
- Adapt continuously changing technologies and play pivotal professional role in sustainable societal development.

# MILESTONES IN OUR ACADEMIC EXCELLENCE

**B.Tech Pharmaceutical Tech & Ph.D Programme**
Bharathidasan Institute of Technology, Tiruchirappalli
1999

**M.Pharm Pharmaceutical Analysis & M.S. (by Research)**
Anna University, Tiruchirappalli
Indo-US Collaboration
2007

Anna University, Chennai
2012

Indo-German Collaboration
2015

**DST - FIST Supported & NBA Accredited (First cycle)**
2018

Indo-Italy Collaboration
2022

Silver Jubilee celebration
Indo-US Collaboration
2024

**2005**
M.Pharm Pharmaceutics
Bharathidasan Institute of Technology, Tiruchirappalli

**2010**
National Facility for Drug Development for Academia, Pharmaceutical and Allied Industries (DST Supported)

**2013**
M.Tech Biopharmaceutical Technology &
Department recognised as a Centre for Excellence in Nanobio Translational Research (Autonomous)
Anna University, Chennai

**2017**
National Facility for Bioactive Peptides for Milk (DST Supported)

**2019**
Pharmanest EDII-ABIRF Indo-Japan collaboration

**2023**
M.Tech Pharmaceutical Biotechnology
Anna University, Chennai

# FACULTY ACHIEVEMENTS

**Prof. Dr. K. Ruckmani**
Former HOD
Director of Centre for Excellence NBTR
Holds **1 US & 3 Indian patents**. & 20.23 crores GIA
Mentored **9 Postdocs, 25 PhDs & 1 MS**.
**Top 2% Scientist (Stanford List, 2021)**
**First Women PhD from TN**

**Prof. Dr. A. Puratchikody**
Former HOD
Holds **2 patents**, **Rs. 61.03L GIA**
Mentored **1 Postdoc & 11 PhDs**.
**Awarded Innovation (2015), Endowment (2011), Young Scientist (2006, 2008) | INSA Fellow (2019-20) | Best Paper (IJPS)**

**Prof. Dr. E. Sanmuga Priya**
Secured **Rs. 86.68 L GIA**
Mentored **2 PhDs**.
**Award-winning researcher (IPSCON 2023) | Academic & research leader**

**Prof. Dr. P. Selvamani**
Head of the department
**1 (Indian patent) & ₹865 L GIA**
Mentored **3 postdocs & 6 PhD scholars**
**Young Investigator Award (2015), Distinguished Researcher Award (2024), Researcher Award – APTI (2025)**
**CMI Level 5 Award (2021)**

**Dr. S.Latha**
Holds **2 patents**, **Rs. 69.784 Lakhs**
Mentored **1 Postdoc, 2 PhDs & 2 MS**
**Awards: Young Scientist, DAAD, MIF Pharmacy Teacher, Young Pharmacist, DBT Research Training**

**Dr. R.Vijaya**
Holds **2 patents**, **Rs. 66K GIA**
Mentored **1 PhD**

**Dr. A. Shanmugarathinam**
Secured **Rs. 100.23 L GIA**
Mentored **4 PhDs**

**Dr. A. Umamaheswari**
Holds **2 patents, Rs. 31.27 L GIA**
Mentored **1 PhD**
**Gold Medalist, Best Paper & Poster Awards (2017, 2023).**

**Dr. P. Senthamil Selvan**
Holds **1 patent, Rs. 57.70 L GIA**
Mentored **2 PhD**
**Dr. P.D. Sethi Merit Award 2013 for HPTLC research**

**Dr. K. Kavitha**
Holds **1 patents, Rs. 0.16 L GIA**
Mentored **3 PhDs**
**Gold Medal, National & IIFPT Prizes, Outstanding Personality Award**

**Dr. S. Lakshmana Prabu**
Holds **7 patents, Rs. 67.80 L GIA**
Mentored **4 PhDs**

**Dr. M. Vijayalakshmi**
Holds **1 patents, Rs. 60K GIA**
Mentored **1 PhD**
**NPTEL-AICTE, APP Best Performer, Excellence & Appreciation Award.**



## Non Teaching Staff

**Mr.N.Padmanabhan**
Professional Assistant II

**Mrs.M.Shanthi**
Professional Assistant II

**Mrs. M.Thirunirai senthamil selvi**
Professional Assistant II

**Mrs.C.Muthuchelvi**
Clerical Assistant

**Mr.M.Balasubramanian**
Peon

**Mrs.N.Kasthuri**
Peon

**Ms.A.Raja keerthiga**
Hourly Basis LA

# PROGRAM OVERVIEW

**B.Tech in Pharmaceutical Technology**

- Duration: 4 Years | 8 Semesters
- Eligibility: 10+2 with Physics, Chemistry, Mathematics
- **Core Focus:**
  1. Drug Design & Development
  2. Formulation Engineering
  3. Pharmacology & Toxicology
  4. Regulatory & Quality Systems
  5. Nanotechnology
- **Career Tracks:** Industry, Research, Higher Studies, Entrepreneurship
- **Affiliated to:** Anna University

**M.Tech in Pharmaceutical Biotechnology**

- Duration: 2 Years | 4 Semesters
- Eligibility: UG Degree & Valid scores in TANCET/GATE
- **Core Focus:**
  1. Molecular Biology & Genetic Engineering
  2. Biopharmaceuticals & Biosimilars
  3. Pharmaceutical Biotechnology in Drug Development
  4. Nanobiotechnology & Targeted Drug Delivery
  5. Bioprocess Engineering & Fermentation Technology
- **Career Tracks:** Industry, Research, Higher Studies, Entrepreneurship
- **Affiliated to:** Anna University

**Ph.D. (Doctor of Philosophy)**

- Duration: 3-6 Years
- Eligibility: M.Tech/M.E./M.Sc in relevant field (Pharmaceutical Technology/Biotechnology/Chemical Engineering)
- **Core Focus:**

1. Advanced Drug Design & Development
2. Novel Formulation Engineering
3. Pharmacology & Toxicology
4. Regulatory & Quality Systems
5. Nanotechnology & Targeted Drug Delivery

- **Career Tracks: A**cademia, Industry R&D, Research Institutes, Entrepreneurship
- **Affiliated to:** Anna University

## SPONSORED RESEARCH PROJECTS

The Department of Pharmaceutical Technology has secured an impressive total of **₹458.64 lakhs** in competitive research funding from prestigious national and international agencies. These projects underscore the department's commitment to advancing pharmaceutical sciences through innovation, interdisciplinary collaboration, and global engagement.

Total Sponsored Research Funding: **₹458.64 Lakhs**

**Key Funding Agencies:**

1. Council of Scientific and Industrial Research (CSIR)
2. Indian Council of Medical Research (ICMR)
3. Department of Science and Technology (DST), Government of India
4. Entrepreneurship Development Innovation Institute (EDII), Tamil Nadu
5. Japan Society for the Promotion of Science (JSPS), Japan
6. Africa-India Mobility Fund – DBT, Wellcome Trust, Indian & African Academies
7. DST–Industry Academia Linkage

**Research Domains:**

- **Inhalable Drug Delivery:** Development of nano-in-micro powder formulations for respiratory infections.
- **Inflammation and Immunology:** Identification of protein signaling pathways to design anti-inflammatory agents.
- **Agro-Biotechnology:** Creation of smart pesticide formulations for enhanced crop productivity.
- Pharmaceutical Entrepreneurship: Establishment of the Pharma Nest Incubation Centre to support innovation and start-ups.
- **Cancer Nanomedicine:** Development of peptide-conjugated magnetic nanoprobes for targeted theranostics.
- **Polymer Drug Delivery Systems:** Engineering biocompatible carriers for poorly soluble drugs.
- Smart Oral Drug Delivery: Magnetically triggerable tablets for targeted ulcer therapy.

## PATENTS

**National Patents:**
15 (9 Granted + 6 Applied)
**International Patents:**
2 (1 Granted + 1 Applied)
**Grand Total (All Patents):**
17

## DEPARTMENT AT A GLANCE

**No of Ph.D Guided -** 46
**Approved UG Intake per year** - 60
**Approved PG Intake per year -** 12
**Placement Index -** 82.00
**No of Publications -** 318
**Research Grants -** ₹1726.5862 Lakhs
**Events Organized -** 25
**MOU -** 03

PURDUE UNIVERSITY

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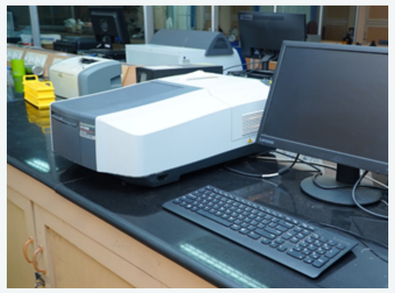
Università di Genova

# LABORARATORY FACILITIES

1. Problem Solving and Python Programming Laboratory
2. Physics and Chemistry Laboratory
3. Biochemistry Laboratory
4. Physical Pharmaceutics Laboratory
5. Microbiology Laboratory
6. Analytical Methods and Instrumentation Laboratory
7. Physiology and Pharmacology Laboratory
8. Medicinal Chemistry
9. Bioprocess Engineering Laboratory
10. Chemistry of Natural Products Laboratory
11. Technology of Dosage Forms Laboratory
12. Biopharmaceutics and Pharmacokinetics Laboratory





## Core and Foundational Courses (Semesters I–IV)

**Semester I:**

- Professional English – I
- Matrices and Calculus
- Engineering Physics
- Engineering Chemistry
- Problem Solving and Python Programming
- Heritage of Tamils / Alternative
- Python Programming Laboratory
- Physics and Chemistry Laboratory
- English Laboratory

**Semester II:**

- Professional English – II
- Statistics and Numerical Methods
- Physics of Materials
- Basic Electrical, Electronics and Instrumentation Engineering
- Engineering Graphics
- Tamils and Technology / Alternative
- Engineering Practices Laboratory
- Basic Electrical & Electronics Lab
- Communication Lab / Foreign Language
- NCC Credit Course Level 1 (Optional)

**Semester III:**

- Transform and Partial Differential Equations
- Chemical Process Calculations
- Microbiology
- Pharmaceutical Chemistry
- Biochemistry
- Human Anatomy and Physiology
- Microbiology Laboratory
- Biochemistry and Physiology Laboratory
- Professional Development

**Semester IV:**

- Applied Chemical Engineering Thermodynamics
- Fluid Mechanics
- Cell and Molecular Biology
- Physical Pharmaceutics
- Pharmaceutical Analysis
- Environmental Sciences and Sustainability
- Pharmaceutical Chemistry Laboratory
- Physical Pharmaceutics Laboratory
- Industrial Training/Internship I
- NCC Credit Course Level 2 (Optional)

## Advanced and Elective Courses (Semesters V–VIII)

**Semester V:**

Pharmaceutical Dosage Forms
Unit Operations in Pharmaceutical Industries
Pharmacology
Professional Electives I–III
Mandatory Course – I (Non-credit)
Dosage Forms Laboratory
Pharmacology Laboratory

- Industrial Training/Internship I

**Semester VI:**

- Heat and Mass Transfer Operations
- Instrumental Techniques in Drug Analysis
- Open Elective I
- Professional Electives IV–VI
- Mandatory Course – II (Non-credit)
- Heat and Mass Transfer Laboratory
- Instrumental Techniques Laboratory
- Industrial Training/Internship II
- NCC Credit Course Level 3 (Optional)

**Semester VII:**

- Regulatory Requirements in Pharmaceutical Industries
- Biopharmaceutics and Pharmacokinetics
- Human Values and Ethics
- Elective – Management

- Open Electives II–IV
- Industrial Training/Internship II

**Semester VIII:**

- Project Work / Internship (20 weeks, 10 credits)

## Professional Elective Course Verticals

- Drug Design & Development
- Medicinal Chemistry
- Bioinformatics and Cheminformatics
- Protein Structure, Function and Proteomics
- Computer-Aided Drug Design
- Regulatory Toxicology
- Clinical Research and Pharmacovigilance
- Formulation and Manufacturing Technology
- Technology of Fine Chemicals and Bulk Drugs
- Preformulation Technology
- Manufacturing Technology of Dosage Forms
- Industrial Process and Scale-Up Techniques
- Novel Drug Delivery Systems
- Pharmaceutical Packaging Technology
- Quality Control and Assurance
- Biological Spectroscopic Techniques
- Quality Assurance in Pharmaceutical Industries
- Audits and Regulatory Compliance
- Validation in Pharmaceutical Industries
- Quality Management Systems
- Product Development and Technology Transfer
- Pharmaceutical Industrial Management
- Pharmaceutical Production Management
- Pharmaceutical Supply Chain Management
- Safety and Disaster Management
- Management Information Systems
- Industrial Psychology and Human Resource Management
- Project Management for Pharmaceutical Technology
- Open Electives
- Cover topics such as:
- AI & ML, IoT, Data Science
- AR/VR, Sustainable Manufacturing, Renewable Energy
- Space Engineering, Robotics, Nanotechnology
- Food Engineering, Biotechnology
- (Selected from emerging technologies and other departments)
- Mandatory Non-Credit Courses
- MC-I Options:
- Gender Studies
- Literature
- Film Appreciation
- Disaster Management
- MC-II Options:
- Yoga, Ayurveda, Siddha
- History of Science in India
- Public Policy
- Industrial Safety
- Environmental Sustainability

# KEY PLACEMENT PARTNERS

pro1 HEALTH

SOLARA Active Pharma Sciences

Zifo

Sai Mirra Destiny for Innovation

TEYRO TEYRO LABS PRIVATE LTD

MICRO LABS

COTIVITI

Abbott A Promise for Life

Somerset Pharma LLC

Pfizer

madras pharma

epi EPISOURCE

Cipla Caring for life

Solistaa

Maiva

SOFTGEL HEALTHCARE PVT. LTD.

muthra Industries Pvt. Ltd.

interMed Caring & Committed

L&T Technology Services

Biocon Biologics

Steril-Gene

ICON

Waters THE SCIENCE OF WHAT'S POSSIBLE.™

Optum

Apollo PHARMACY A Promise Beyond Prescription

CAPLIN POINT LABORATORIES LTD.

Mahathi Infotech

NAVITAS LIFE SCIENCES

EXTROVIS

FACE Prep Campus Recruitment Training

InterMed Pharmaceutical Laboratories

Omega Healthcare Excellence in Business Outsourcing

VEE TECHNOLOGIES Extraordinary Outcomes

Kawman

ZIFO RnD SOLUTIONS

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# TIRUCHIRAPPALLI – 620 024


TIRUCHIRAPPALLI, TAMILNADU

0431-2407946

pharmatech.head@aubit.edu.in