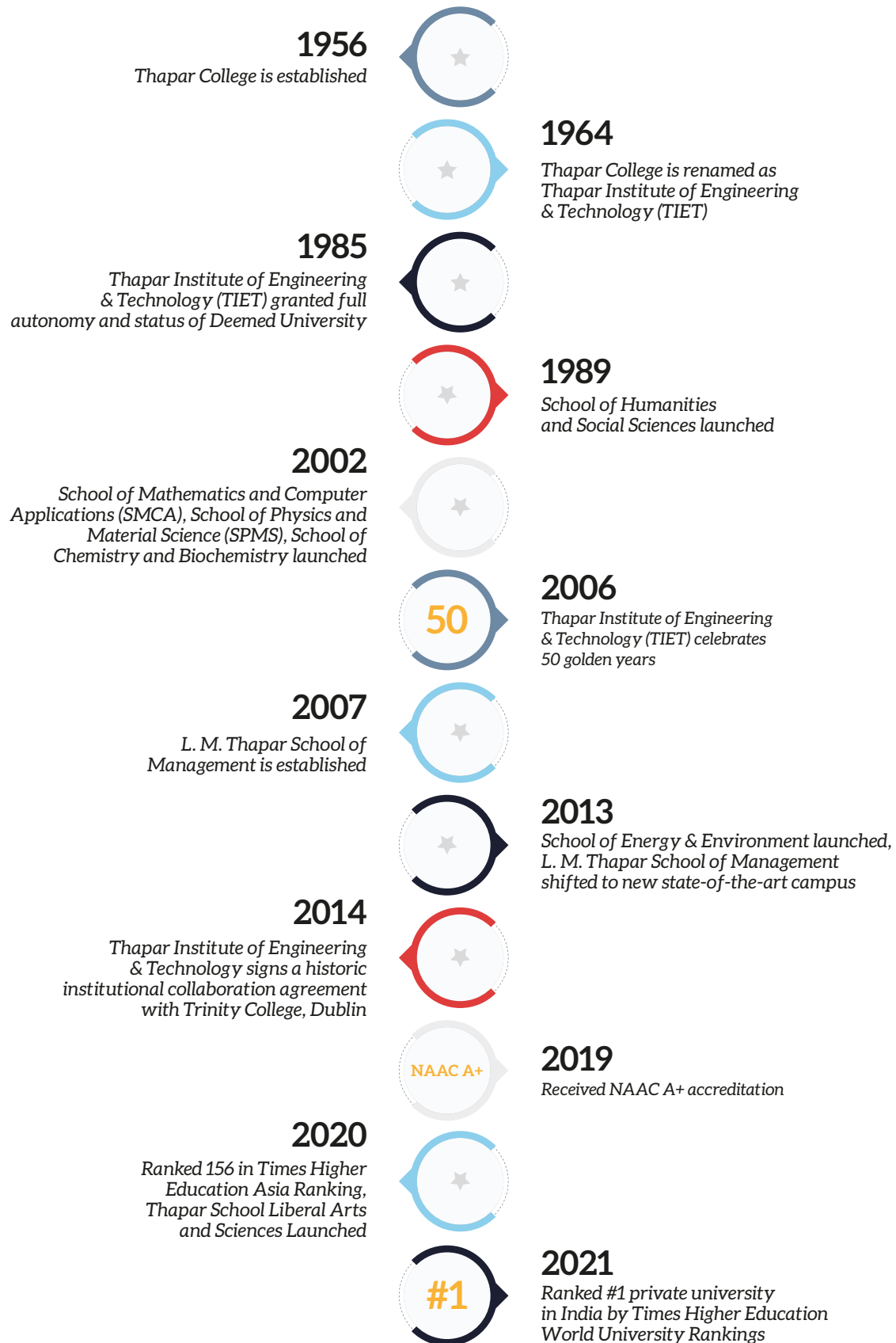




SCHOOL OF CHEMISTRY & BIOCHEMISTRY



THAPAR INSTITUTE
OF ENGINEERING & TECHNOLOGY
(Deemed to be University)



THAPAR INSTITUTE OF ENGINEERING & TECHNOLOGY

Thapar Institute of Engineering & Technology (TIET) was established in 1956 as a collaboration between the then state of Patiala and East Punjab States Union (PEPSU), the central Government and the Patiala Technical Education Trust (PTET).

Thapar Institute of Engineering and Technology currently ranks as one of the top private universities in India.

Thapar Institute of Engineering & Technology (TIET) brings to the world 63 years of excellence in teaching and research. The institute is in Patiala & spread over a 250-acre campus with modern infrastructure and beautiful gardens. The institute has grown and evolved during the last six decades of its existence. Nearly 18,500 engineers have left its portals so far, distinguishing themselves as proud Thaparians in diverse fields across India and the globe. In recognition of the contribution of the institute towards engineering and science education, TIET was granted full autonomy and the status of a Deemed to be University in 1985 by UGC.



SCHOOL OF CHEMISTRY & BIOCHEMISTRY

Vision

To be recognized as the school of excellence in higher education, research and innovation in the areas of chemical sciences and to remain sensitive and responsive to changing needs of the society.

Mission

- To create, develop and disseminate new knowledge in chemical sciences.
- To provide post-graduate education in the areas of chemical sciences and support undergraduate and other educational programs.
- To remain active in areas on the forefront of chemical research on an international standard relevant to the Indian industry and society.
- To provide state-of-the-art infrastructure and conducive environment for faculty and students to produce globally competent professionals.



School of Chemistry and Biochemistry (DST-FIST sponsored) initiated its journey as an independent school in 2002 to endorse teaching and research in Chemistry. In order to promote the interdisciplinary research in chemical and biological sciences another area - Biochemistry - was introduced in 2015.

Our school has an experienced and ever-enthusiastic faculty members having research experiences from recognized institutes in India and abroad. The broad research interests of our faculty members are Organic Synthesis and Medicinal Chemistry, Chemical Sensing and Environmental Chemistry, Chemical Biology, Catalysis and Nanochemistry, Computational Chemistry etc. The research laboratories are well-equipped with specialized instruments (eg, TGA, GC, GC-MS, HPLC, Fluorimeter, FTIR, UV-Vis, NMR, etc.).

As one of the most research active department, school of chemistry and biochemistry is currently providing an ideal blend of strong theoretical knowledge and research skills. The futuristic curriculum is designed to enable students to rationalize and solve different types of scientific and socially relevant problems.

Academic Programs and Courses

Academic Programs

The school offers academic programs both at postgraduate and Ph.D. levels. M.Sc.(Chemistry) has been offered since 2007 while M.Sc. (Biochemistry) started in 2015. Both the postgraduate programs are supported by excellent infrastructure, experienced and qualified faculty and TIET's placement cell.

M.Sc. – CHEMISTRY

After completing this program, students can opt for a doctoral degree either in India or abroad. They can also join colleges or coaching institutes as faculty as opposed to doing work for the chemical and IPR industry.

M.Sc. (Chemistry) is a two-year (four semester) program designed to strengthen fundamental concepts of chemistry while focusing on demands of the industry. There is equal stress on both theoretical and practical aspects that involve state-of-the-art techniques like NMR, XRD, SEM etc. The curriculum, revised periodically, employs advanced and most recent pedagogical approaches like student-centric learning, research based teaching and experiential learning.

The unique features of this program include a research project in the final semester. There is also a mandatory requirement of six to eight weeks of summer training at the end of the 1st year. This gives our students an edge in terms of hands-on experience with advanced instruments, awareness of contemporary research topics, literature survey, thesis writing and presentation skills.

After doing M.Sc. (Chemistry) many of our alumni have gone on to get their Ph.D. from the reputed institutes of India (IITs, IISERs, INST or RCB) and abroad (USA, Germany, Canada, Ireland). TIET's placement cell helps our students to secure placement in reputed industries like Agilent technologies, Sun Pharma, IOCL, and coaching institutes like Aakash, Lakshya with attractive packages.

M.Sc. - BIOCHEMISTRY

The extensive training provided in the M.Sc. (Biochemistry) makes our students employable in various sectors like careers in biochemical, pharmacological, toxicological research laboratories and jobs in agriculture, food processing, healthcare and the IPR industry.

This research-based two year (four semester) program, includes regular biochemistry courses in addition to preparing students for interdisciplinary topics like bioorganic chemistry, neurochemistry, nano-biology, and bioinformatics. The curriculum involves forty to fifty percent practical experience with hands-on training on instruments like gel electrophoresis, fluorescent microscope, infrared spectrophotometer etc.

The unique features of this program include dissertation work for a semester, eight weeks of summer training in academia or industry and imparting training for thesis writing, literature survey and presentation skills. This also gives our students an opportunity to publish research articles (paper) in leading international journals and conferences.

Most of our alumni do their Ph.D. in India (IIT, IISER, TIET, PAU) or abroad. Many have been placed in various industries like Sun Pharma, Reckitt, Baxter, Parexel and coaching institutes like Fiitjee, Lakshya, or Akash with attractive packages.

Ph.D. PROGRAM

Currently our school is also offering high quality doctoral program in different areas: Analytical Chemistry, Organic Chemistry, Organometallic Chemistry, Environmental Chemistry, Medicinal Chemistry, Inorganic Chemistry, Nano Chemistry, Nano-Materials and Bio-physical Chemistry. Our school is one of the most productive departments at TIET in terms of research publications in peer-reviewed, SCI journals, setting up national and international collaborations as well as receiving many competitive, high-budget research grants. Accordingly, our teaching and research laboratories are well-equipped whereby the research labs are equipped with specialized instruments (viz., TGA, GC, GC-MS, HPLC, Fluorimeter, FTIR, UV-Vis, NMR, etc.). Our students enjoy extensive research training during this program which allows them to gain key skills that act as a gateway to their future. Our research scholars and many of our Ph.D. students had received postdoctoral offers from several institutes in abroad and a few of them are well placed in academics as well as industries. They have also received several prestigious fellowships and awards (Marie Currie post-doctoral Fellowship, DST Women Scientist Award, SERB National post-doctoral Fellowship, UGC-MANF etc.).

UG Courses

The school offers chemistry courses to all engineering undergraduates as per the requirement of their specialization. The courses cover advanced fundamentals of general and applied chemistry. Following courses are taught.

B.Sc. CHEMISTRY (MAJOR & MINOR) COURSES

Currently our school is offering several chemistry courses for 'major' and 'minor' to support the B.Sc. programs at Thapar School of Liberal Arts and Sciences. These include all basic courses in the area of physical, inorganic and organic chemistry, spectroscopic techniques, catalysis, computers in chemistry etc. Students are expected to build up a strong basic background along with being familiar with recent developments in the field of basic and applied chemistry.

APPLIED CHEMISTRY

The course offered to all the 1st year engineering students imparts an understanding of the principles and theories of chemistry to solve real-world problems. It includes basic concepts of spectroscopy, water treatment and analysis, conventional fuels and polymers, their green alternatives, electrochemistry along with related lab experiments, etc. Students are expected to apply the concepts learned in this course through problem-solving and illustrations.

GENERAL CHEMISTRY I & II

These courses are offered to all B.Sc. programs at Thapar School of Liberal Arts and Sciences as well as B.Tech. (Biomedical Engineering). It helps the students to prepare the concepts of chemistry experimentation and measurements with a strong emphasis on analytical skills. It covers physical and chemical properties of atoms, ions and molecules and their relationship with different phase transformations followed by kinetic and thermodynamic properties. Students are expected to rationalize their fundamental learning concepts in these courses by various problem solving assessments.

Major Research Areas

Catalysis and Nanochemistry

Organic Synthesis and Medicinal Chemistry

Chemical Biology and Biophysical Chemistry

Computational Chemistry

Chemical Sensing and Environmental Chemistry

ONGOING PROJECTS

- Nanocarriers for topical delivery of pathogen-specific RNAi molecules for sustained protection of pea crop against powdery mildew
- Plasmonic metal – TiO₂ nanocomposite for H₂O splitting to H₂ and its instant use in photocatalytic hydrogenation of organic compounds
- Deciphering prion-like amyloid assembly mechanisms of Tau using biophysical tools
- A combined experimental and computational investigation of abiotic bio-transformations: Application in the sustainable and highly selective synthesis of indole-based drugs or their precursors
- Magnetic Core Supported Heterogeneous Catalysts for The Glycerol Carbonate Synthesis
- Ruthenium Catalyzed C-H Bond Activation Strategy for C-C and C-X Bond Formation for Biological Active Compounds
- Dynamic Combinatorial Chemistry: Accessing Complex Topologies and New Receptors
- Design and Synthesis of Tri/Tetraphenylethylene derivatives as Fluorescent Receptors and Anticancer Agents

Alumni Success Stories

Dr. Aadil Bathla

Ph.D. 2020
Postdoctoral Fellow,
Department of Civil and
Environmental Engineering,
Hanyang University, Seoul,
South Korea

Maansi Aggarwal

M.Sc. Chemistry 2020
Qualified GATE in
Chemistry

Komal Jaswal

M.Sc. Chemistry 2020
Graduate student in
Pennsylvania State
University, USA

Dr. Rayees Ahmad Rather

Ph.D. 2017
Postdoctoral Fellow,
Department of Environmental
Engineering, Auburn
University, USA

Kuldeep Singh

M.Sc. Chemistry 2020
Qualified GATE in
Chemistry

Hasmita Gaba

M.Sc. Chemistry 2019
Consultant, Concur IP
Consulting Pvt. Ltd.,
Noida

Dr. Amit Mishra

Ph.D. 2018
Recipient of prestigious
"Marie Curie Fellowship 2021"

Konpal Raheja

M.Sc. Chemistry 2020
Qualified GATE in
Chemistry

Disha Kanpila

M.Sc. Biochemistry 2019
R&D Assistant in Reckitt
Benckiser

Faculty Achievements



Dr. Soumen Basu

is enlisted on the global list of top 2% scientists in the "World Ranking 2021" for research in the fields of Nanomaterials



Prof. Susheel Mittal

has joined as the Vice-Chancellor of Sardar Beant Singh State University (S.B.S.S.U.), Gurdaspur



Prof. Bonamali Pal & Prof. Satnam Singh

has received best research paper award in the 35th Convocation of Thapar Institute of Engineering & Technology, Patiala on Nov. 8, 2021



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