# V. UNIVERSITY INSTITUTE OF ENGINEERING & TECHNOLOGY

## ABOUT THE INSTITUTE

University Institute of Engineering & Technology (UIET) was established by Panjab University as a Department in 2002.

. It offers four years Bachelor of Engineering (B.E), two years Master Engineering (M.E), and full time Ph.D degrees in Biotechnology, Computer Science and Engineering, Information Technology, Electrical and Electronics, Electronics and Communication and Mechanical Engineering. It offers Nine post graduate programs in Biotechnology, Computer Science and Engineering, Computer Science and Engineering (Cyber security) Information Technology, Electrical, Engg.(Power system) Electronics and Communication, Mechanical Engineering, Microelectronics and Material Science & Technology. Four UG Programs (namely Computer Science and Engineering, Electrical and Electronics, Electronics and Communication and Mechanical Engineering) and three PG courses (namely Electronics and Communication, Mechanical Engineering and Computer Science and Engineering) have been NBA accredited. UIET has MOUs with industry leaders and academia like Infosys, Spice Digital Limited, PGIMER, CSIO, C-DAC, the University of Western Australia, IIT Kanpur, IIT Roorkee, Nottingham Trent University, UK etc. The Pedagogy at UIET places high emphasis on the development and application of Engineering principles across disciplines and training students for addressing the challenges faced by industry, research organizations and community. Hands on training in design Laboratories, and networking with industry makes our students ready for research, teaching, product development and problem solving, UIET nurtures exchange relationships with institutes abroad, wherein our students are facilitated to participate in summer training programs.

The faculty attracts various sponsored research projects at the national and international level. A number of sponsored research projects from agencies like DIT, AICTE, DST, Department of Biotechnology Welcome Trust, Meity etc. have led to the establishment of a number of specialized research laboratories which are freely available to students for learning by working. Some of the major projects that have developed UIET in recent years include, grants under TEQIP-III, a world Bank project and a Design Innovation Centre (DIC) from the Ministry of Education (MOE), Government of India, DBT-BUILDER grant, NTU-PU collaboration grant

## FACULTY

| Designation | Name |
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|---|---|---|
| Associate Professors | Sanjay Vohra | Mechanics of Materials |
| | Manoj Kumar Sharma | Active Noise Control, Control Systems, Renewable Energy Sources and Neural Networks &Fuzzy logic |
| | Veenu Mangat | Data Mining & Warehousing, Machine Learning |
| | Naresh Kumar | Wireless and Mobile Communication |
| | Shuchi Gupta | Thearetical & Computational condemned matter physics |
| | Damanjeet Kaur | Power systems |

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|---|---|---|---|---|
| B.E. in Mechanical | 81+4 EWS +8 NRI+ 4 FN | 4 years | | |
| M.E. in Computer Science & Engineering | 108+2 NRI+ 1 FN | 2 years | Eligibility Conditions: B.E. or B.Tech. or equivalent in Computer Science and Engineering / Information Technology with at least 60% marks in aggregate from Panjab University or any other University recognized by Panjab University as equivalent thereto. | Mode of admission: Preference will be given to GATE qualified candidates. Candidate appearing for PU-CET (PG) will be given admission if some seats remain vacant after exhausting the list of GATE qualified candidates. |
| M.E. in Electronics & Communication | 20+2 NRI+ 1 FN | 2 years | Eligibility Conditions: B.E. or B.Tech. or equivalent degree in Electronics / Electronics & Communication Engineering / Electronic and Telecommunication Engineering with at least 60% marks in aggregate from Panjab University or any other University recognized by Panjab University as equivalent thereto. | Mode of admission: Preference will be given to GATE qualified candidates. Candidate appearing for PU-CET (PG) will be given admission if seats remain vacant after exhausting the list of GATE qualified candidates. |
| M.E. in Mechanical Engg. | 20+2 NRI+ 1 FN | 2 years | Eligibility Conditions: B.E./ B.Tech. in Mechanical Engineering / Production Engineering with at least 60% marks in aggregate from Panjab University or any other University recognized by Panjab University as equivalent thereto. | Mode of admission: The admission shall be made on the basis of Entrance Test P.U. CET (PG) to be conducted by the Panjab University. GATE qualified candidates shall be exempted from the P.U.-CET (P.G.) Test. However, in case of eligible GATE qualified candidates, the merit list shall be as per the GATE Score obtained and shall be offered the seat at the first instance. |
| M.Tech. Microelectronics | 12+3 SC/ ST +2 NRI + 1FN | 2 years | Eligibility Conditions: B.E. / B.Tech | |

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| | | | Computer Science & Electronics Engineering / Software Engineering with at least 60% marks in aggregate from Panjab University or any other University recognized by Panjab University as equivalent thereto. | |
| M.E. in Electrical Engg. (Power System) | 20+2 NRI+ 1 FN | 2 years | Eligibility Conditions: Any candidate who has completed B.E. / B.Tech. in Electrical / Electrical & Electronics Engineering with at least 60% marks in aggregate from Panjab University or any other University recognized by Panjab University as equivalent thereto. | Mode of admission: Preference will be given to GATE qualified candidates. Candidate appearing for PU-CET (PG) will be given admission if some seats will be left vacant after the GATE qualified candidates admissions. |
| M.Tech. Material Science & Technology | 20+2 NRI+ 1 FN | 2 years | Eligibility Conditions: M.Sc. (Physics), M.Sc. (Chemistry), B.E. (Mechanical / Electrical / Electronics and communication / Civil / Production) with at least 60% marks in aggregate from Panjab University or any other University recognized by Panjab University as equivalent thereto. | Mode of admission: Preference will be given to GATE qualified candidates. Candidate appearing for PU-CET (PG) will be given admission if some seats will be left vacant after the GATE qualified candidates admissions. |
| M.E. in Biotechnology | 20+2 NRI+ 1 FN + 1** | 2 years | Eligibility Conditions: B.E. / B.Tech. Biotechnology Engineering with at least 60% marks in aggregate from Panjab University or any other University recognized by Panjab University as equivalent thereto. | Mode of admission: Preference will be given to GATE qualified candidates. Candidate appearing for PU-CET (PG) will be given admission if some seats will be left vacant after the GATE qualified candidates admissions. |
| ME Computer Science and Engineering (Cyber Security) | 15+2 NRI+ 1 FN | 2 years | Eligibility Conditions: B.E. or B.Tech. or equivalent degree in Computer Science & Engineering / Information Technology with atleast 60% marks in aggregate from P.U. or any other recognised University. | Mode of admission: Admission will be done on the basis of GATE Score. In Case of left over seats, admission will be done on the basis of Entrance Test P.U.-CET-(P.G.) to be conducted by the Panjab University. |

* 5% Concession is admissible in eligibility marks to SC/ST/BC/PwD Candidates.
** one seat in ME Biotechnology course of UIET, every year consecutively for four years, starting from coming session (2022-2023), be enhanced, as stipulated in DBT BUILDER grant received by UIET

## Ph.D. Programs

| S.No. | Name of the Department | Seats | Duration | Admission Criteria |
|---|---|---|---|---|
| 1. | Computer Science Engineering | | 3-6 years | See Ph.D. Prospectus 2022 |
| 2. | Information Technology | 24 | | |
| 3. | Electrical and Electronics Engineering | 35 | | |
| 4. | Bio-Technology | 13 | | |
| 5. | Mechanical Engineering | - | | |
| 6. | Electronics & Communication Engineering | 16 | | |
| 7. | Applied Science | 00 | | |

SCHEME AND SYLLABI: Detailed scheme and syllabi of the courses are available at Panjab University official website: https://puchd.ac.in/syllabus.php?qstrfacid=5

THRUST AREAS: Faculty is involved in research in thrust areas like Design and Manufacturing, Traffic Sensing and Information Technologies, Medical Devices and Restorative Technologies, Energy Harvesting and Management Technologies, Medical Image Processing, computer Networking, Cloud Computing, Nano-Materials, Stem Cells, Wireless Communications, Power Systems, Composite Materials, New Physics Searches with Collider Experiments at LHC, CERN and KEK, Japan etc.

PLACEMENTS: The objective of Training and Placement Cell (TPC) is to provide the best training and placement opportunities to students. Efforts are made by the dedicated members of the team to approach companies and to invite them on campus to recruit students and to provide them the placement and internship opportunities. Over the past many years, UIET has built a strong relationship with many companies that visit UIET on regular basis to recruit students.

TPC also organizes special lectures and soft skills programs regularly, wherein experts from industry are invited and they make students aware about the latest technologies/ processes in industry and guide them about how to appear for interviews and prepare for group discussions.

On an average, around 55 companies visit UIET every year and around 350 offers are made to final year students who participate in the placement process. The highest package in the session 2021

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automated solutions for industrial applications, Computational tools for disease detection, CAE/digital modeling/digital twins. A total of 9 projects with 9 faculty members as Principal Investigators (PI) from PU and 9 PIs from NTU involving 25 students from UIET were appointed as visiting researchers

NTU-PU STPC would promote six months internship of UIET students at NTU including bursary, Accommodation and Travel grants, Joint PhD and Master Degrees with exchange of students at PU and NTU, Collaborative Course curriculum development programs, Collaborative FDP/Workshops/Conferences, Purchase of common software as central repository for all projects.

Center would also explore prestigious collaborative grants under newer themes related to global challenges such as Smart Medical Devices and Health care, Identification of Biomarkers, Diagnostic Kits, Viral detections, Composite materials, Novel manufacturing, Water Desalination, Microfluidics, Gas Sensing Mechanism.

INNOVATION AND STARTUP ACTIVITIES

Design Innovation Centre (DIC)

The Ministry of Education (MoE) formerly known as MHRD, as a part of its 12th Five-year plan (2012-17) has taken a national initiative to set up a network of Design Innovation Centres (DICs) across the country. One Open Design School and a National Design Innovation Network have linked these DICs to evolve a nationwide ecosystem of resource and knowledge sharing to impart education and training to foster the innovative culture of designing products, processes and technologies of need to society. The MoE has approved the establishment of a DIC at Panjab University, Chandigarh to focus on innovations around engineering products, add value to the available engineering designs and promote early-stage start-up companies. It works on Hub and Spoke model where UIET Panjab University is the Hub and CSIO, PEC and HSJIDS PU are its spokes. Several ideas are being perused for developing a new pedagogy in teaching and training in design, new fabrications and innovations. A number of design technologies for smart cities, biomedical devices, advanced materials, navigational and tourism aids, green environment, energy & traffic management, communication etc. are being taken up at the DIC at PU.

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Institution's Innovation Council (IIC, scheme of MHRD) is a committee of faculty, students and experts from industry which conducts multiple activities to promote the Innovation and Entrepreneurship round the year in HEIs campuses. UIET, Panjab University, Chandigarh is one such HEI whose IICs aim is to streamline and strengthen the Innovation and startup ecosystem in the campus. The primary mandate of IIC is to encourage, inspire and nurture young students by supporting them to work with new ideas and transform them into prototypes. The objective is to prepare the students with the skills like Critical Thinking, Design Thinking, Innovative thought process and Entrepreneurial mindset. Several activities are conducted throughout the year to meet the desired target of IIC:

- Various Innovation, IPR and entrepreneurship-related activities are conducted in time bound fashion.
- Several reward innovations are Identified and their success stories are shared with the students.
- Periodic workshops/ seminars/ interactions with entrepreneurs and investors are organized
- Hackathons, idea competition, mini-challenges etc. are organized with the involvement of industries.
- A network with peers and national entrepreneurship development organizations is created.

Innovative projects carried out by institution's faculty and students are highlighted on the Institutes IIC portal.

Technology Business Incubator at UIET (TBIU)

UIET has inculcated a culture to promote 'Make in India' Campaign of GoI among faculty and students and has inaugurated a Technology Business Incubator at UIET (TBIU), Panjab University. TBIU has been created to provide a co-working ecosystem among faculty, students and industry by providing a common space at UIET. This space would primarily be utilized by Ventures that qualify as a nursery incubation project – initiated by one or more members of the academic staff, students and/or alumni of one of a premier institute, supported by the Institute, TBIU or some other technology promotion agency (government or non-government). UIET incubator provides a co-working platform where all engineering expertise converges. UIET provide an ecosystem to evolve and refine technologies and products that require expertise at the interphase of engineering sciences. To this end, TBIU facilitate the incubatees to utilise the resources in all engineering branches at UIET and even in Panjab University, depending upon technical needs of the project. It also connects the incubatees for the technology-downstream commercialisation aspects that may become available through TEC, CIIPP, CRIKC, DIC, IIC and other places in Chandigarh and around. In this respect, TBIU will function as a nodal centre, primarily for engineering technologies and knowhow and enter into suitable MOUs with other Units and organisations to efficiently achieve the synergy required for traversing the journey of engineering students from laboratory to marketplace. It will function as a single point of contact to offer the facilities and resources at UIET for providing various services and consultancies to industry and other outside organisations.

## Dr. S.S. BHATNAGAR UNIVERSITY INSTITUTE OF CHEMICAL ENGINEERING & TECHNOLOGY PANJAB UNIVERSITY

ABOUT THE DEPARTMENT

Dr. S.S.Bhatnagar University Institute of Chemical Engineering and Technology, Panjab University, Chandigarh (http://www.uicet.puchd.ac.in) is a premier Institute in Northern India imparting quality education in Chemical Engineering, Food Technology and allied areas. Institute is currently running the courses in B.E. (Chemical Engineering), B.E. (Food Technology), Integrated B.E. (Chemical Engineering)-MBA, M.E. (Chemical Engineering), M.Tech. (Polymer), M.E. (Food Technology), M.Sc. (Industrial Chemistry) and M.E. (Chemical with specialization in Environmental Engineering). The faculty of the institute is involved in guiding students under Faculty of Engineering & Technology to pursue their research leading to award of Ph.D. degree. The Institute was set up in 1958 in collaboration with Illinois Institute of Technology, Chicago, USA and continues to maintain global standards of excellence in education and research. The Institute has attained status of eminence in academia, R&D within

India and abroad. Over the years, the Institute have been bestowed with research grants from premier funding agencies like DST, AICTE, UGC, DRDO, MOFPI, CSIR, ICAR, TEQIP, etc. The faculty works in collaboration with Industry, Research Organizations etc. contributing extensively towards high quality research.

FACULTY

| Designation | Name | Field of Research Specialization |
|---|---|---|
| Professors | Amrit Pal Toor (Chairperson) | Mass Transfer and Environment Engineering |
| | Meenakshi Goyal | Chemical Technology (Inorganic & Organic), Science & Technology of Carbon |
| | Sanchita Chauhan | Modeling and Simulation, Environmental Engineering, Chemical Reaction Engineering |
| | Anupama Sharma | Polymer Science Engineering, Synthesis of Biodegradable Polymers and their Nanocomposites, Nanocellulose Extraction and its Utilization |
| | Anupama Thakur | Polymer Science Engineering |
| | Seema Kapoor | Thermodynamics, Energy Technology, Nano Biomaterials Engineering |
| | Ritu Gupta | |

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| | | | OR<br>Master's degree in Technical Chemistry/Applied Chemistry/ Industrial Chemistry/Chemistry (with Mathematics upto graduation) or an equivalent examination) with at least 55% marks in aggregate from Panjab University (in case students are awarded degree in CGPA, they must have the conversion formula issued by the concerned University or head of the department) or any other University recognized by Panjab University as equivalent thereto. | Please visit www.puchd.ac.in and www.uicet.puchd.ac.in for update, if any. |
| M.E. (Chemical with specialization in Environmental Engineering)# | 10+1 NRI+ 1 Foreign National | 2 years | B.E./B.Tech (Chemical) 04 years or Five Year Integrated B.E.(Chem.)-MBA at least 60% marks in the aggregate from Panjab University or any other University recognized by Panjab University as equivalent thereto. | Mode of Admission: Preferences will be given to GATE qualified candidates. Candidate appearing for PU-CET (PG) will be given admission if some seats remain vacant after exhausting the li2 ree li2 re[illegible]AhE5 |

## B.E. (Chemical Engineering)

| | Semester I | | Semester II |
|---|---|---|---|
| Paper 1 | Mathematics –I | Paper 1 | Mathematics –II |
| Paper 2 | Physics | Paper 2 | Chemistry II |
| Paper 3 | Chemistry-I | Paper 3 | Electrical & Electronics Engineering |
| Paper 4 | Computer Programming for problem solving | Paper 4 | Introduction to Engg and Technology |
| Paper 5 | Engineering Graphics | Paper 5 | Communication Skills |
| Paper 6 | Engineering Graphics | Paper 6 | Electrical & Electronics Engineering Lab. |
| Paper 7 | Engineering Workshop | Paper 7 | Chemistry II Lab. |
| Paper 8 | Physics Lab. | Paper 8 | Communication Skills Lab. |
| Paper 9 | Chemistry-I Lab. | Paper 9 | Ethics and self-awareness |
| Paper 10 | Computer Lab. | | |
| Paper 11 | Introduction to Env. Science | | |
| | Semester III | | Semester IV |
| Paper 1 | Physical Chemistry | Paper 1 | Heat Transfer |
| Paper 2 | Fluid Flow | Paper 2 | Chemical Engineering Thermodynamics |
| Paper 3 | Energy Technology | Paper 3 | Mechanical Operations |
| Paper 4 | Strength of Materials | Paper 4 | Numerical Methods in Chemical Engineering |
| Paper 5 | Open Elective I | Paper 5 | Engineering Materials |
| Paper 6 | Process Equipment Design | Paper 6 | Heat Transfer Lab. |
| Paper 7 | Physical Chemistry Lab. | Paper 7 | Mechanical Operation Lab. |
| Paper 8 | Fluid Flow Lab. | | |
| | Semester V | | Semester VI |
| Paper 1 | Chemical Reaction Engineering-I | Paper 1 | Chemical Reaction Engineering II |
| Paper 2 | Mass Transfer I | Paper 2 | Mass Transfer II |
| Paper 3 | Chemical Technology (Inorganic) | Paper 3 | Process Dynamics & Control |
| Paper 4 | Department Elective-I | Paper 4 | Chemical Technology (Organic) |
| Paper 5 | Chemical Reaction Engineering Lab. | Paper 5 | Mass Transfer Lab. |
| Paper 6 | Chemical Technology (Inorganic Lab.) | Paper 6 | Process Dynamics & Control Lab. |
| Paper 7 | Process Plant Design I | Paper 7 | Chemical Technology (Organic) Lab. |
| Paper 8 | Chemical Engineering Computation Lab. | Paper 8 | Department Elective I Lab. |
| | | Paper 9 | Industrial Training* |

Paper 7 Biochemistry & Nutrition Lab Paper 7

Paper 3

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|---|---|---|---|
| Paper 6 | Fluid Flow & Mechanical Operation Lab. | Paper 6 | Heat & Mass Transfer Lab |
| Paper 7 | Chemical Technology Lab. | | |

# UNIVERSITY CENTRE OF INSTRUMENTATION AND MICROELECTRONICS

## ABOUT THE CENTRE

The University Centre of Instrumentation and Microelectronics (UCIM) was established in 1995 and offers M.Tech. (Instrumentation) and M.Sc. (Instrumentation) Courses, each of 2 years (4 semesters) duration. The objective of the centre is to generate trained manpower for Modern Sophisticated Instrumentation and for Microelectronics applications. The facilities available have been supplemented by combining it with the DST funded Sophisticated Analytical Instrumentation Facility (SAIF), Central Instrumentation Laboratory (CIL) and University Science Instrumentation Centre (USIC) which are housed in the same building.

## FACULTY

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| Professor | Ganga Ram Chaudhary (Director) |
| Associate Professor | H.P.S.Kang |
| Assistant Professors | Poonam Kumari |
| | Ramesh Kumar Sharma |
| | Anil Kumar |

## COURSES OFFERED (SEMESTER SYSTEM)

| Course | Seats | Duration | Eligibility* | Admission Criteria |
|---|---|---|---|---|
| M.Tech (Instrumentation) | 10+3 SC/ ST+2NRI + 1 Foreign National | | | |

*Elective Subjects
M.Sc (INSTRUMENTATION)

| | Semester I | | Semester II |
|---|---|---|---|
| SEM PO 11 | Sensors, Transducers, and Actuators for Instrumentation | SEM PO 21 | Microprocessor based Instrumentation & System Design |
| SEM PO 12 | Signal conditioning, processing and interfacing techniques | SEM PO 22 | Control System Design |
| SEM PO 13 | Instrumentation components, devices and assemblies | SEM PO 23 | Power Electronics |