BRIEF INTRODUCTION

ACADEMIC PROGRAMMES OF THE INSTITUTE

The Institute offers undergraduate programmes in Engineering & Technology and Liberal Arts and Sciences. The Institute also offers graduate programs leading to MA, MBA, MCA, MSc, ME/MTech degrees, and at the doctoral level, Ph.D. degrees.

The salient features of the programmes are *semester-wise credit system, letter grades*, *continuous evaluation of the students' performance*, *course-wise promotion,* and Choice Based Credit System (CBCS) which provides *flexibility to allow the students to select courses and move at an optimum pace suited to their ability, capacity, and interest*.

ACCREDITATIONS OF THAPAR INSTITUTE OF ENGINEERING & TECHNOLOGY (TIET)

1. **National Assessment and Accreditation Council (NAAC), UGC**
   Thapar Institute of Engineering & Technology has been accredited with 'A+' grade by National Assessment and Accreditation Council (NAAC), UGC.

2. **Accreditation Board for Engineering and Technology (ABET)**
   Five B.E. programs viz Computer Engg., Mechanical Engg., Electronics and Communication Engg., Electrical Engg., and Civil Engg. program of Thapar Institute of Engineering & Technology, Patiala received the prestigious ABET accreditation as a confirmation of meeting the Global Standard of Technical Education. ABET is a US-based organization that accredits post-secondary education programs in "applied science, computing, engineering, and engineering technology", which occurs mainly in the United States (USA) but also internationally.

3. **National Board of Accreditation (NBA)**
   Eligible undergraduate programs are accredited by NBA.

RANKINGS

Our notable rankings include:

National Institute Ranking Framework (NIRF) Rankings

- Ranked 20th in 'Engineering' category in the top Engineering Institutes in the country,
- Ranked 22nd in 'University' category,
- Ranked 40th in 'Overall' category,
- Ranked 49th in 'Management' category,
- Ranked 34th in 'Research' category.

Times Higher Education Rankings

- Ranked in the "601-800" bracket worldwide in the Times Higher Education World University Rankings 2024.
- Ranked at =145th position in Asia in the Times Higher Education Asia University Rankings 2023.
- **THE World University Rankings 2023 by Subject**

  Computer Science: 401-500 bracket worldwide.
  Engineering: 501-600 bracket worldwide.

QS Rankings

- Ranked in the "951-1000" bracket worldwide in QS World University Rankings 2024.
- Ranked in the "281-290" bracket in QS Asia University Rankings 2024.
- **QS World University Rankings by Subject 2023**

  Engineering – Electrical & Electronic: 451-500 bracket worldwide
  Computer Science & Information Systems: 451-500 bracket worldwide

Shanghai Subject Rankings

- **Shanghai Rankings by Subject 2023**

  Engineering – Electrical & Electronic: 401-500 bracket worldwide
  Computer Science & Engineering: 201-300 bracket worldwide

ACADEMIC UNITS

The academic units of the Institute are **Departments, Schools, and Centres.** The role of the **Departments** is to organize and conduct undergraduate, postgraduate, and doctoral programmes in a relevant engineering/technological disciplines, while the **Schools** cater to only postgraduate and doctoral programmes. The **Centres** are special inter-disciplinary units serving the Institute as a whole.

A. DEPARTMENTS

(i) Chemical Engineering Department
(ii) Chemistry & Bio-Chemistry
(iii) Civil Engineering Department
(iv) Computer Science & Engineering Department
(v) Department of Biotechnology
(vi) Electrical & Instrumentation Engineering Department
(vii) Electronics & Communication Engineering Department
(viii) Energy and Environment
(ix) Mathematics
(x) Mechanical Engineering Department
(xi) Physics & Materials Science

B. SCHOOLS

(i) Humanities and Social Sciences
(ii) L M Thapar School of Management (Off campus)
(iii) Thapar School of Liberal Arts and Science

C. CENTRES

(i) Central Library
(ii) Central Workshop
(iii) Centre for Industrial Liaison and Placement (CILP)
(iv) Centre for Training & Development (CTD)
(v) Centre of Relevance and Excellence (CORE) in Agro and Industrial Biotechnology
(vi) Centre of Information and Technology Management (CITM)
(vii) Science and Technology Entrepreneur's Park (STEP)
(viii) Experiential Learning Centre

Medium of Instruction – English

FACULTY

For an academic institution, recruitment of quality faculty is very important. In TIET, faculty members are recruited through a rigorous selection process. The candidate has to present his/her work before the internal committee and thereafter is subjected to rigorous interviews by a panel of external experts from IITs/IIMs. The candidates should have done their PhD from the top 50 institutions in NIRF rankings. This is even more important to train and retain the world-class faculty. We have taken a number of steps to retain the faculty and have entered into an MOU with Trinity College, Dublin (TCD) to train the faculty members on state-of-the-art learning practices and pedagogies. For this purpose, we have established a Centre for Academic Practices and Student Learning at our Campus, and plan to get all the faculty members certified on these practices by experts from TCD. We hope to bring sweeping changes in the methodologies adopted by faculty as of now and are confident that this initiative shall help faculty members in imparting better learning to our students, shall help faculty members to involve students at all levels in their research endeavors and thus producing graduates who can serve our country better.

MoU WITH FOREIGN UNIVERSITIES/ORGANIZATIONS

Thapar Institute of Engineering & Technology has Institutional MoUs with top universities globally.

- Virginia Tech, United States of America
- Trinity College Dublin (TCD),
- University of Groningen, Netherlands,
- University of New South Wales,
- University of Queensland, Australia,
- University of Toledo, United States of America,
- Tel Aviv University, Israel,
- University of Leeds, United Kingdom.
- Miami University,
- University of La Rochelle,
- University of Malta,
- University of Twente,
- University of Angers,
- Temple University

The Institute also has highly active research and academic collaboration with industries. Some of them are

- Tata Motors,
- Tata Consultancy Services,
- Infosys,
- PepsiCo India holding Pvt. Ltd.,
- NVIDIA graphics Pvt. Ltd.,
- Samsung R&D Institute India-Bangalore Pvt. Ltd.,
- MEITY (GOI) for Science and Technology Entrepreneurship Park,
- Future First academics,
- Oracle Academy,
- NSIC,
- NXP,
- n+i

ALUMNI UPDATE

2023: A Year of Reconnecting, Recognizing, and Rewriting Stories at the Alumni Office

2023 vibrated with the spirit of connection, service, and shared legacy, thanks to the tireless efforts of the Alumni Office. From honoring heroes to celebrating milestones, we witnessed a tapestry of events that reaffirmed the enduring strength of our community.

National Rekindling:

- Heartfelt Reunions: Delhi, Mumbai, and Bangalore pulsed with laughter and reminiscence as alumni from all walks of life reunited. These gatherings, infused with nostalgia and heartfelt conversations, underscored the power of our alumni network.

The Global Tapestry:

- International Meets: From the bustling streets of San Francisco to the historic charm of London, Detroit, and Canada, our global alumni network convened in joyous reunions. These vibrant gatherings celebrated cultural diversity and reaffirmed our shared identity as Thapar Institute of Engineering and Technology graduates.

Celebrating Heroism and Perseverance:

- Tribute to Gur Iqbal Singh Sandhu (Batch 1970): We bowed our heads in homage to this courageous alumnus who sacrificed his life for the nation. The "Tribute to Gur Iqbal Singh Sandhu" event resonated with profound respect and gratitude, reminding us of the values of service and sacrifice held dear by our community.

Reawakening Memories:

- Jab We Met: Reunion of Batch 1977: "Jab We Met" wasn't just a movie title; it was the joyous theme of the Class of 1977's reunion; time stood still as the Class of 1977 relived their college days in the reunion. The air crackled with laughter and anecdotes, showcasing the unbreakable bonds forged within these hallowed walls.

Honoring Excellence:

- Distinguished Alumnus Award: Recognizing exceptional achievements, the Distinguished Alumnus Award ceremony lauded two individuals (Tarun Kapoor and Robin Raina) whose contributions have shaped their fields. Their stories inspired our current students and instilled pride in our alumni network.

Global Collaborations:

- MaRIHE & Erasmus Mundus Scholarship Students - India Chapter: Fostering knowledge exchange and international camaraderie, MaRIHE hosted representatives from universities across the globe. This dynamic forum strengthened ties between institutions and empowered future leaders.

Golden Memories, Silver Reflections:

- Golden Jubilee of Batch-1973 & Silver Jubilee of Batch-1998: These milestone celebrations resonated with nostalgia and pride. For both classes, it was a chance to reconnect, relive cherished moments, and witness the remarkable transformation of their alma mater.

A Legacy We Carry Forward:

2023 was a testament to the unwavering commitment of the Alumni Relations Office to building a vibrant and inclusive community. In 2024, we pledge to continue nurturing these connections, offering invaluable opportunities for professional development, mentorship, and lifelong learning. Join us, be a part of this thriving tapestry, and write your chapter on the rich history of Thapar Institute of Engineering and Technology.

CENTRE FOR TRAINING & DEVELOPMENT (CTD)

Producing world class professionals by imparting quality education has been a priority for Thapar Institute of Engineering and Technology (Deemed University). However, these professionals operate in 'human organizations' requiring effective communication, appropriate behaviour, good interpersonal skills, problem solving & decision-making skills and an understanding of global work environment. The Centre for Training & Development (CTD) is responsible for addressing the above needs to transform students into employable, future ready, global resources, demonstrating the following:

- Global sensitivity
- Excellence seeking behaviour
- Social entrepreneurial mindset

Key Responsibility Areas (KRAs)

- Identifying the need for aptitude & soft skills training
- Conceptualizing, designing, organizing and implementing training programs based on the above needs
- Providing on-campus mentoring and career counselling sessions
- Inviting Industry experts to interact with students on contemporary employability and work environment challenges
- Liaising with CILP to understand current corporate requirements and accordingly customizing training programs
- Administering and delivering standardized tests like the GMAT (Pearson Testing)

In light of the above, CTD conceptualizes, designs and implements a series of learning and development programs for students. The immediate objective of these programs is to prepare students for campus placements and enable them to secure their dream job! In the long run these programs aim to acclimatize students to the industry & society challenges, helping them to perform with empathy & intellectual humility.

I. Employability Training Programs

These programs aim to prepare students for various placement related challenges, enhancing their probability for professional, personal and societal success.

✓ **Employment Development Skills**

This program is positioned as a generic elective for UG students in their 2nd, 3rd& 4thyear of study. It prepares students for campus placement and industry related challenges. It includes areas like team dynamics & collaboration, emotional intelligence, leadership, managing diversity etc.

✓ **PlaceMentor**

This program helps students to get experiential insights into the selection process of various companies. It is designed to create an interaction between the students already placed and the ones currently sitting for placements. Successful students connect with the aspiring ones to share their experiences, and handle queries related to interviews, group discussions, extempore presentations etc.

✓ **Placement Preparator**

This is an annual program and is meticulously designed to prepare students for specific employability related challenges.

Program Features:

- Intensive concept sessions on basics of Group Discussion, Case Study, Guesstimate, Psychometric Test, Extempore Speech and Personal Interview
- Simulated practice sessions on Group Discussions, Case Studies & Personal Interviews

- Strategic performance feedback with customized improvement plan
- One-on-one Resume Building sessions (weekly)

✓ **Summer School**

The Centre conducts a 5 – week intensive reviser module on aptitude skills, group discussions, interviews, case studies and guesstimates. This program is organised for pre final and final year students poised to sit for job and internship placements after the summer break.

Program Features:

- Comprehensive workshops on employability skills
- Concept and application sessions on aptitude skills
- Practice sessions on GDs and Case Studies

✓ **Apti – Doze**

The Centre conducts regular weekly sessions to prepare students on quantitative, verbal and logical reasoning.

Program Features:

- Concept sessions on quantitative ability, data interpretation, logical ability, verbal ability and reading comprehension
- Practice sessions on various areas of aptitude assessment
- Test taking and strategy sessions on various areas of aptitude assessment

✓ **Words - Worth**

The Centre conducts regular weekly sessions to prepare students for communication related challenges.

Program Features:

- Communication drills with feedback to improve
- Prepared and impromptu presentation tasks with strategic inputs
- Employability related communication exercises

✓ **Placement Symposium**

This is an event for final year students where exhaustive concept and practice GD-PI (Group Discussion-Personal Interview) sessions are organized for the participants, with a comprehensive performance feedback, enabling them to bridge the between actual and expected levels. It is organized just before the onset of the placement season, and is mandated by the DOAA.

Program Features:

- Strategy sessions on Group Discussions, Case Studies, Psychometric Tests, Aptitude Tests and Personal Interviews
- One-on-one interview sessions with performance analysis and action plan
- Closely moderated practice Group Discussions & Case Studies
- Aptitude Test covering both general & technical areas

II. Career Support Programs

These programs are designed for students targeting discrete career paths upon completion of UG/PG engineering course. The encompassing scope of career support programs include the following:

✓ **Career Advancement**

In this interaction, students are assisted in identifying the career path most suited to their interests, aptitude, and motivation. They are typically advised to write the Career Proficiency Test, which generates career suitability coefficients based on their work personality, career drive, and behaviour. The report of this test serves as a medium to engage more meaningfully with the students. Students choose from career options like core engineering, consulting, management, public administration, etc. Career-related tips are also shared with students regularly. In this direction, the center also launched a bi-monthly e-publication called Coach, giving material on aptitude and soft skills required for various career challenges. Regular career bites are circulated on the center's Instagram page, with a substantial viewership and follower base. Edge'ucator sessions are organized occasionally to sensitize students with respect to industry and society readiness. One-on-one assistance is given for resume building, where students are helped to develop resumes customized to meet specific requirements stated in the job description of organizations.

- ✓ **Competitive Examinations**

  In this engagement, students are mentored and guided regarding the competitive examinations they target, like CAT, GRE, GMAT, IELTS, etc. Guidance is provided to help students with respect to acing various stages of these examinations like concepts, application, and test-taking strategy. The centre signed a contract with Pearson VUE to organize the GMAT test administration on campus. Recently, the centre also signed an MOU with ETS, the organization that conducts the GRE worldwide, to provide GRE guidance and coaching to interested students. Coaching is also organized to prepare students in all four areas of the IELTS – listening, speaking, writing, and reading.

- ✓ **International Admissions**

  Looking at the soaring number of students that pursue MS and MIM options abroad, the centre launched its international admissions support services in 2019. Since then, the center has guided students in choosing relevant programs/schools, drafting letters of recommendation, and preparing purpose statements. Specific counseling is provided for building profiles viewed favorably for various engineering and management school admissions. Directional inputs are imparted to enrich profiles to meet various schools' entry and admission norms, like taking up relevant coursework and project work and engaging in socially useful and productive work.

III. Professional Readiness Programs

These programs are offered to students requiring specific inputs on certain areas of professional significance. Students are awarded a certificate upon successful completion of the program. Sessions are conducted on weekends across a total duration of 32 - 40 hours; All UG/PG students are eligible to enrol. Based on popular student demand, the following programs are currently being offered:

- ✓ **Finance for Engineers**

  The course, 'Finance for Engineers', has been designed to sensitize students w.r.t the financial environment. Such a sensitivity is imperative for appreciating the vast domain of business and economy, and is also evaluated by companies like JP Morgan during the campus placement process.

- ✓ **Business Analytics Edge**

The course, 'Business Analytics Edge', has been designed to address the challenge of 'Data Driven Decision Making' assessed by various companies during the placement process.

- ✓ **Power Business Intelligence**
  The course, 'Power Business Intelligence', has been designed to help students understand the standalone application of Microsoft Power BI through the combination of fours tools: power query, power pivot, power view, power map.

- ✓ **Data Visualization through Tableau**
  This course provides an in-depth exploration of data visualization using Tableau, a powerful and widely used business intelligence tool. Participants gain hands-on experience creating compelling and interactive visualizations to effectively communicate insights from complex datasets. The course covers fundamental concepts of data visualization, Tableau functionality, and best practices for creating impactful visual representations of data.

- ✓ **Communicating Professional Worth**
  The "Communicating Professional Worth" course is tailored for students seeking to enhance their ability to effectively communicate their value, achievements, and contributions. In today's competitive business environment, the skill of articulating one's professional worth is crucial for career advancement, recognition, and successful collaborations. This course equips participants with the tools and strategies to confidently and persuasively communicate their worth to colleagues, superiors, and potential employers.

- ✓ **Personal Branding**
  The "Personal Branding" course is a comprehensive exploration of the principles and strategies needed to define and cultivate a strong personal brand. In today's competitive professional landscape, individuals need to stand out and communicate their unique value proposition effectively. This course provides participants with the tools and insights to build and maintain a powerful personal brand that aligns with their goals and aspirations.

- ✓ **Leading with Impact**
  The "Leading with Impact" course is designed for students seeking to enhance their leadership skills and make a positive, influential impact within their organizations. This transformative program goes beyond traditional leadership models, focusing on a holistic approach that combines self-awareness, strategic thinking, effective communication, and the ability to inspire and motivate teams.

- ✓ **Creative Thinking for Professional Success**
  The "Creative Thinking for Professional Success" course is designed to unlock and cultivate the creative potential within students, fostering innovative problem-solving and driving success in today's dynamic work environments. This course goes beyond traditional thinking patterns, encouraging participants to embrace creativity as a critical skill for personal and organizational growth.

IV Skill Assessment Programs

CTD organizes various assessment tests in different semesters of UG/ PG course. In the first semester of UG/PG students write a Skill Assessment Test (SAT) which measures their abilities in 13 areas critical to employability. Students are given a comprehensive report with a detailed action plan. In the fourth semester of UG/

second semester of PG, an advanced version of the SAT is conducted, and is supported with comprehensive counseling. In the sixth semester of UG/ fourth semester of PG, a Placement Readiness Test is conducted for a near real simulation of the aptitude tests conducted by companies during campus placements.

V Customized Training Programs

These programs are conceptualized, designed and implemented as per the needs raised by particular department/school/centre. The most recent program here is the 'Smart Skills Development Program' for IEP students.

- ✓ **Smart Skills Development Program @IEP students**

  To help students to acclimatise culturally and professionally to the host country's environment and the university life there. Modular sessions, as described below, aim to sensitize students w.r.t soft skills required for successfully transforming into global engineering professionals.
  - Goal Setting & Introduction
  - Employability Related Communication
  - Etiquette & Behaviour
  - Customization & Adaptation in the Host Country

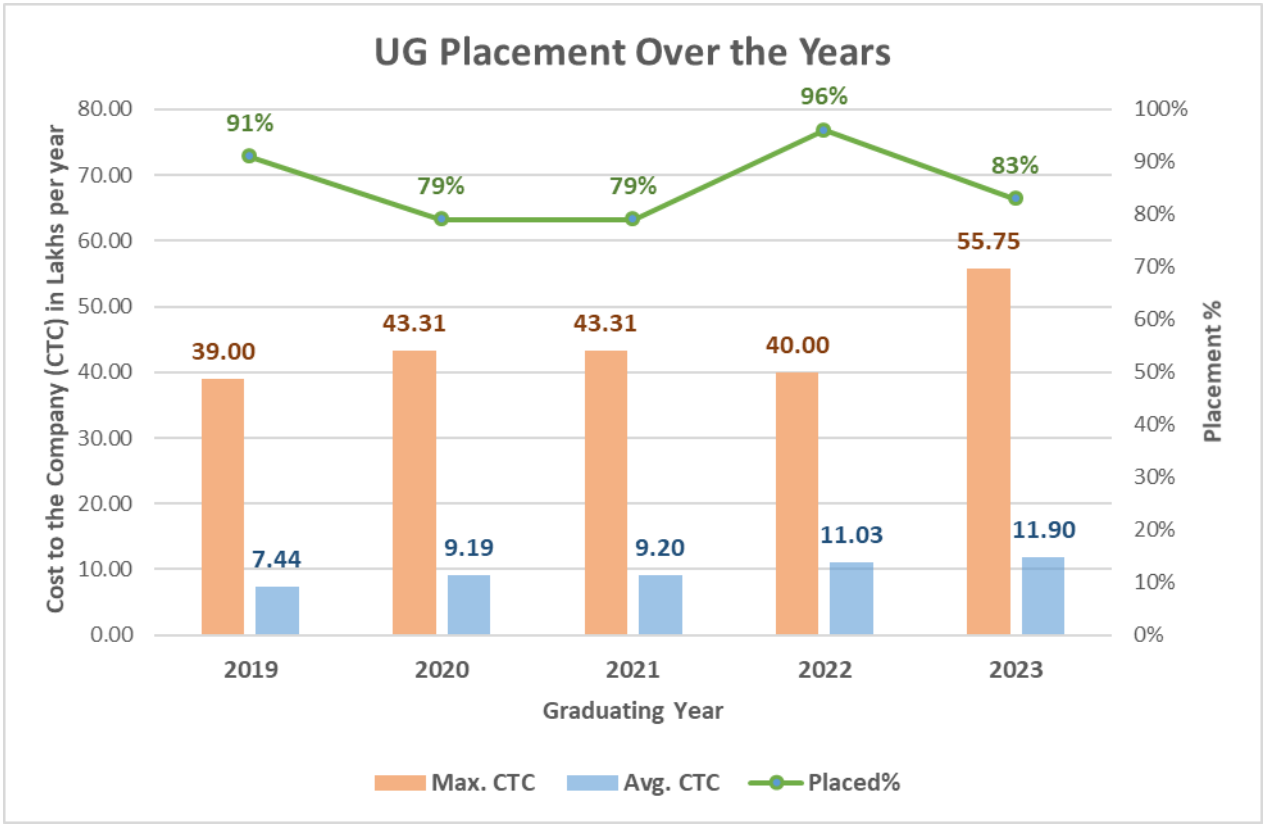
    Boot Camp (a week before onboarding)

- *Students are not charged additionally for any of these programs.*
- *The programs are conducted in a way so as not to disturb the overall academic equilibrium.*
- *Trainers are carefully selected on the basis of domain competence/expertise/ experience.*
- *Prior registration is mandatory for all programs.*
- *Students can reach out to CTD team at training@thapar.edu.*
- *The Centre is active on social media platforms like Instagram and LinkedIn.*

CENTRE FOR INDUSTRIAL LIAISON AND PLACEMENT (CILP)

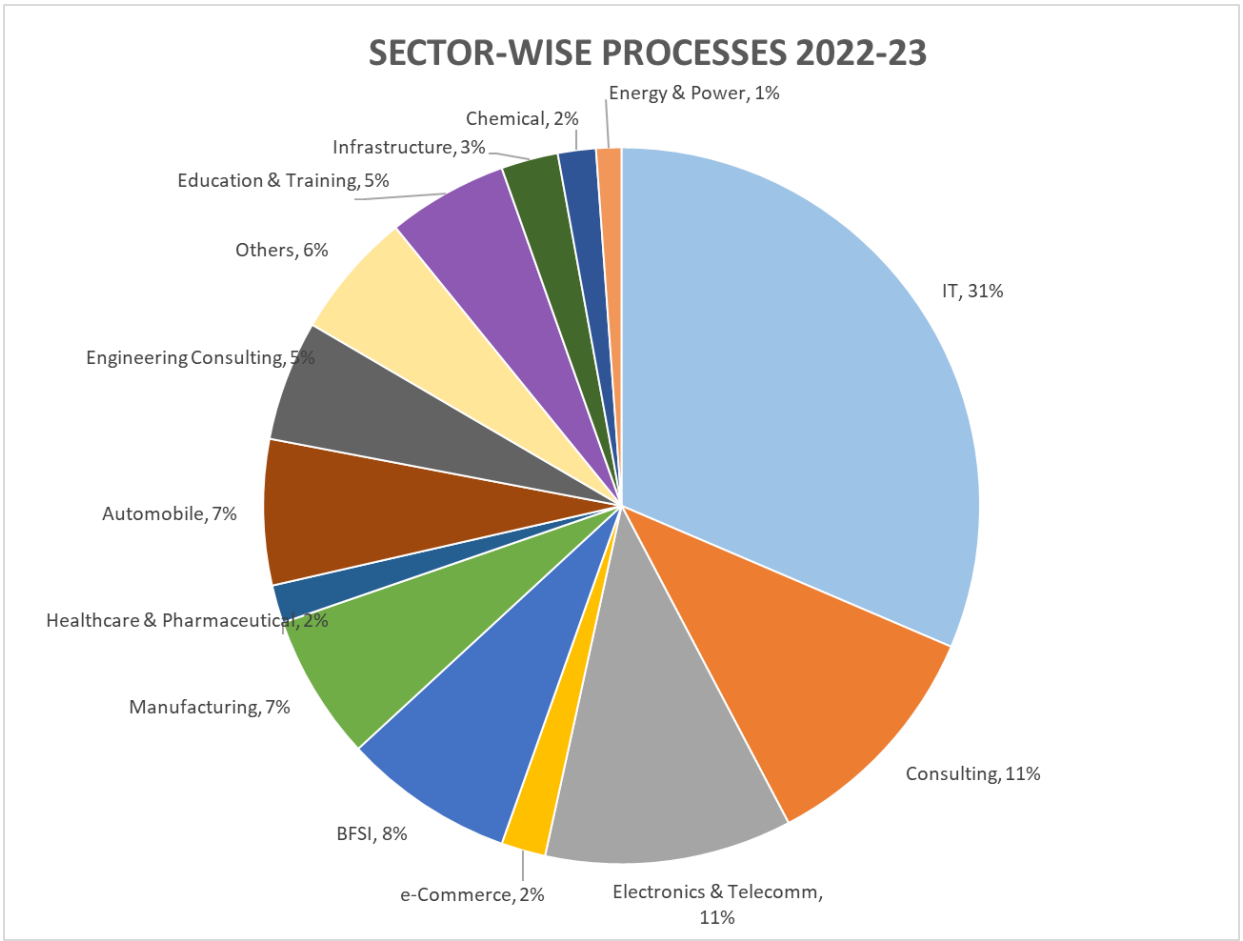
CILP is the interface between TIET and the Industry for various engagements like campus placement, internships, expert talks, research collaborations and consultancy, industry inputs in curriculum and other mutually beneficial activities.

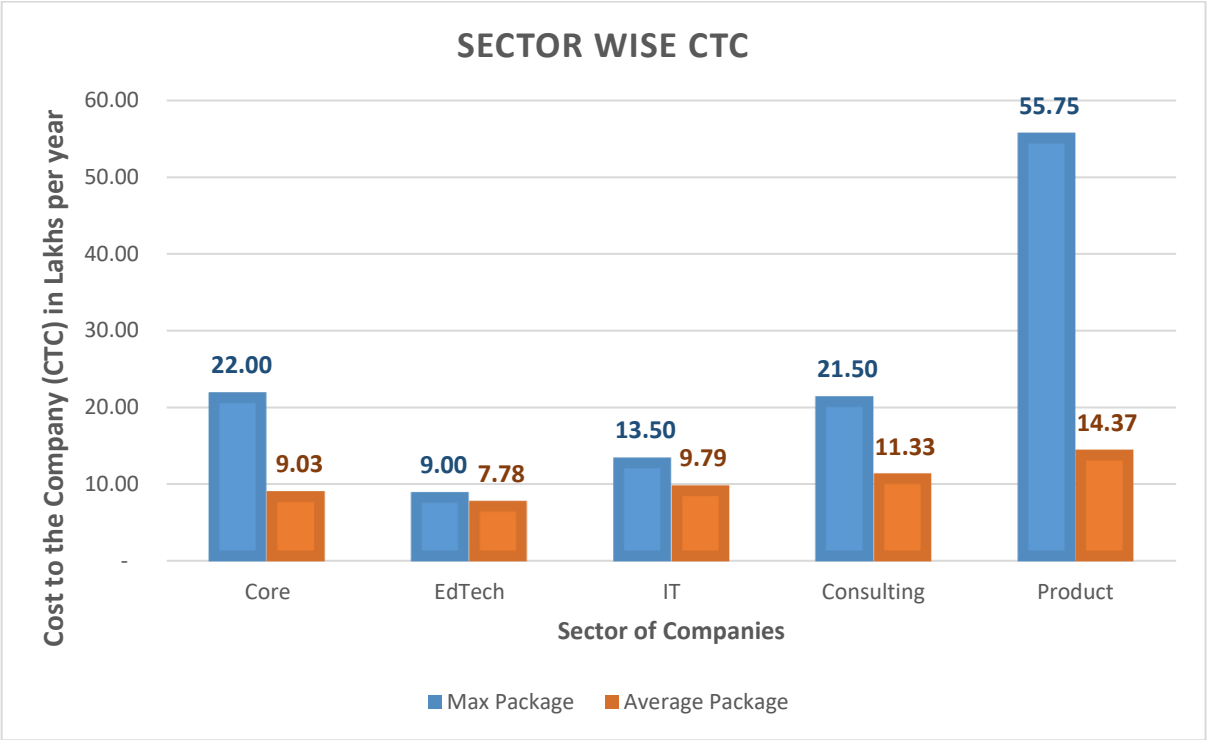
CILP facilitates processes involve in campus recruitment by national and international employers of the students. The past five years' record of UG student's placement is given in the chart below.



ACTIVITIES OF CILP

- **Campus Recruitment**





- **Internship in Industry of six/twelve months under project semester**

  All students across BE/B.Tech. Engineering disciplines are required to spend a full semester in the industry completing an industrial project under the joint supervision of industry supervisors and TIET faculty members. The PG students, however, undergo one full year's internship in the industry completing their industrial project.

  Similarly, the students of MCA undergo a Systems Development Project (SDP) of sixteen-week duration & the students of M.Sc. undergo six-week summer training in the industry. This provides a system of education that formally integrates academic studies with related work exposure.

- **Summer Internships**
  Summer internships which are after 2nd/3rd year are optional and give an opportunity to student to get exposure of practical industrial environment. Top-notch companies have been using this as an opportunity to access the student and give a Pre-Placement Offers (PPOs) before the start of the campus season.

- **Industry Institute Interactions**
  Interactions between industries and academia for curriculum development, expert lectures and workshops, research collaborations, resource sharing for the benefit of the students are also in the preview of CILP.

OUR PROMINANT RECRUITERS

S#	Companies	S#	Companies
1	Accenture India Private Limited	51	ION Trading India Private Limited
2	Addverb Technologies Private Limited	52	JPMorgan Chase & Co.
3	Advantage Club (Work Advantage)	53	JSW Group
4	Airbnb	54	Jubilant FoodWorks Limited
5	Amadeus Software Labs India Pvt Ltd	55	Juniper Networks, Inc.
6	AMD (Advanced Micro Devices, Inc.)	56	Landis + Gyr Limited
7	Amdocs Development Center India LLP	57	Larsen & Toubro Limited
8	American Express	58	LG Electronics India Pvt. Ltd
9	Anand Automotive Private Limited	59	Make My Trip India Private Limited (Go-MMT)

S#	Companies	S#	Companies
10	Apple	60	MAQ Software
11	Arcesium India Private Ltd	61	Maruti Suzuki India Limited
12	Asian Paints Limited	62	McDermott International
13	Atlan	63	McKinsey & Company
14	Attentive AI Solutions Pvt Ltd	64	MG Motor India
15	Axis Bank	65	MSB Digital Pvt. Ltd
16	Axxela	66	Mylo
17	Bain & Company	67	Nation with NaMo
18	Barclays	68	NatWest (Royal Bank Of Scotland)
19	Barco Electronic Systems Pvt. Ltd.	69	Naukri.Com
20	BlackRock	70	Nestlé India
21	Blue Yonder, Inc.(JDA Software)	71	NXP Semiconductors
22	Bosch	72	Observe.AI
23	CaaStle (Gwynnie Bee)	73	Open Futures Group
24	Celigo	74	Optum
25	Cisco Systems, Inc.	75	Oracle India Private Limited
26	Cloudera, Inc.	76	Paytm
27	D. E. Shaw India Private Limited	77	Pidilite Industries Ltd.
28	Dell Technologies	78	ProcDNA
29	Deloitte Consulting India Pvt. Ltd.	79	Providence Global Innovation Center
30	ElectricPe	80	Reliance Industries Ltd.
31	Engineers India Ltd.	81	Salesforce, Inc.
32	Ericsson India Global Services Private Ltd.	82	Samsung Engineering India
33	EXL Service	83	Samsung Research Institute Noida
34	Expedia Group	84	Schlumberger Limited
35	EY Global Delivery Services	85	Shell India Markets Private Limited
36	Fastenal Company	86	Siemens EDA (India) Private Limited
37	Fractal Analytics	87	Signify (Philips Lighting)
38	Futures First Info Services Pvt Ltd	88	STMicroelectronics
39	Gameskraft	89	Stryker Global Technology Center
40	GEP Worldwide	90	Synopsys
41	Havells India Ltd.	91	Tata Consultancy Services Limited
42	Hero MotoCorp Ltd.	92	Tata Motors Limited
43	Honda Motorcycle & Scooter India Pvt. Ltd.	93	Tata Technologies
44	Honeywell International Inc.	94	Texas Instruments
45	Housing.com	95	Tredence
46	HSBC Software Development (India) Private Ltd.	96	Western Digital Corporation
47	Incedo Inc.	97	zHealtHEHR
48	Infinera	98	ZS Associates India Pvt Ltd.
49	Intel Technology India Pvt. Ltd.	99	Zscaler Inc
50	Intuit Inc	100	Zynga Gaming Network

CONTEMPORIZATION PROGRAM:

In the present age, Universities are becoming wise to various strategies and striving to deliver top-quality education globally. Thapar Institute of Engineering & Technology, Patiala (TIET) has proven its mettle in the past and is at the forefront of embracing change and delivering quality education to students from across the country. TIET brings to the world 65+ years of sparkling excellence. Its portals are a testimony to the making of professionals whose brilliance has shaped new ideas. Recognized amongst the leading privately managed engineering institutions of the country and the best of its kind in the north-western region of India. TIET is ranked 23rd amongst top engineering institutes and universities in NIRF Ranking in 2021. TIET is determined to move up the ranking ladder by excelling in all spheres of teaching, research, and placements. At present TIET is amongst the top few Indian private

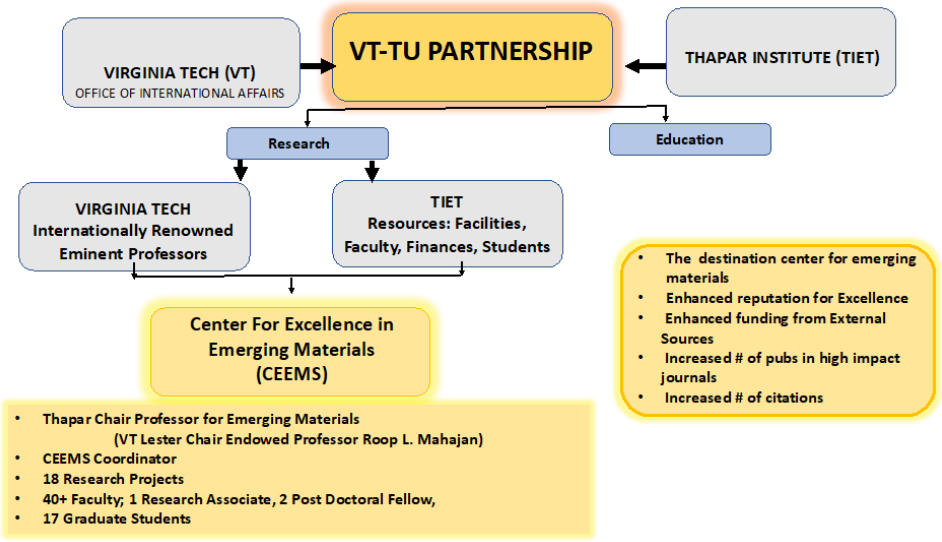
universities that are recognized among the academic world and global rankings. TIET has already embarked upon a transformation journey with the completion of the first phase of its ambitious contemporization program. It has taken multiple initiatives to fill the identified gaps, build upon its strengths, and better its peers.

TIET has grown impressively in both size and activities during the last six decades of its existence. TIET's main campus at Patiala is spread over 250 acres. TIET believes that a well laid out and practical infrastructure is a visible differentiator for the institute – a well-functioning infrastructure allows students, faculty, and researchers to focus on their core tasks of learning and research. TIET had embarked upon a major infrastructure upgrade project at the Patiala campus since 2015 to support the growth in a number of students, as well as to give shape to its vision of a world-class university with world-class infrastructure. With the 2nd phase of the growth focussing on continuous improvement, it is imperative to develop more infrastructure. The institute has already initiated the 2nd phase of its growth program that will continue for another five years. This phase puts major emphasis on building on our already impressive research expertise.

Research at TIET is at the apex of the institute's long-term strategic plan, which is to be a leading research-focused and teaching-intensive institute in India. Research is a central theme of the institution's mission. Research and innovation will facilitate academic collaborations, industrial interactions, and knowledge transfer; and provide support to academics on research funding streams, preparing bid proposals, and negotiating research contracts. The institution spends a substantial amount of its budget on research activities. This creates numerous opportunities for graduate and undergraduate students and provides a faculty with an enriching environment. In the future, the institution foresees significant growth in research activities across disciplines for interdisciplinary and multidisciplinary research. Individual academicians at the institution have developed their own plans indicating the potential areas of research, infrastructure requirement, and possibilities of collaboration with leading academics at global/national universities/organizations and industry. In addition to the department-specific research, TIET has also identified key cross-cutting research themes for setting up multiple Centres of Excellence (COEs).

Going forward the institution aims to make targeted investments to develop new interdisciplinary and inter-institutional collaborations to establish six centres of excellence (COE) across identified research themes. TIET is also undertaking multiple other initiatives to build research excellence focused on solving real-world problems and providing students with experiential learning for better application and analytical skills. TIET has already established three chairs to lead the Food Security, Emerging Materials, and Advanced Manufacturing Centres. The food security chair is led by Prof Nir Ohad from Tel Aviv University and the Emerging Materials Chair is led by Prof Roop Mahajan from Virginia Tech. The third chair was established recently with the appointment of Prof Noam Eliaz from Tel Aviv University to lead the Advanced Manufacturing Centre. All three Chairs are eminent professors with wide research experience in their fields. Two of these centres are already operational at Patiala and both Chair Professors have followed similar strategies in running their respective centres. The Advanced Materials Centre will become operational in 2022-2023. As the 6 CoEs get established, it is expected that close to 200 academic members of TIET staff, 100 Postdoc or Ph.D. students would be working in these centres during the next five years.

TIET-VT Centre of Excellence – Emerging Material



Intense research in recent years has culminated in rapid progress in science and technology that affects every sphere of human life. The development of multifunctional materials and miniaturization of devices have been the keys to this remarkable stride. While our understanding of the fundamentals of materials continues to improve, the techniques and instruments to study and design them become more complex and challenging. It is only through sophisticated instrumentation we know of materials what we know now. It is important that the multifunctional materials be conditioned to possess diverse properties; the analysis, characterization, and establishing operational mechanisms and reliability of the systems are equally critical and thus, the role of the analytical instruments becomes even more inevitable. To achieve these goals, TIET has established a "Centre of Excellence in Materials Research" at TIET, Patiala. This Centre is in line with the long-term goals of the institution to improve the quality of research at TIET and bring it to a level that is acclaimed internationally.

CEEMS' Thrust Area and their leadership teams:

Thrust Area	Title
1	Coal-derived graphene-x (graphene oxide, reduced graphene oxide, graphene quantum dots and other derivatives).
2	Graphene-x-polymer nanocomposites, with a focus on environmentally friendly applications.
3	Bio-x (molecular and cellular biology, and biotechnology) to develop environment-friendly alternatives to fossil fuels and plastics, diagnostic and drug delivery and treatment tools, and higher yielding and nutrient rich crop-plants.
4	Exploratory research to capture high-risk, high-reward basic and applied research crosscutting the first three thrust areas.
5	Computational and Simulation (a core capability in recognition of the important role played by scientific computation as the third leg of learning and research).

TIET-TAU Centre Of Excellence - Food Security

With over 7 billion mouths to feed globally, ensuring a secure supply of food is a burgeoning and critical challenge for scientists and policymakers alike. Over 1 billion people are currently suffering from malnutrition, while another 2 billion are either undernourished or actually suffering from an excess of caloric intake due to a short supply of healthy food. The demand for energy is rising at the same time, thus increasing pressure on agriculture to grow biofuel as well as food. In India, the combination of growing population, urbanization, and rising of living standards results in an increasing demand for food while at the very same time arable land and resources available to agricultural use are both declining. Providing long-term solutions for these critical issues requires not only advances in the biological and chemical sciences but also a re-evaluation of strategic business issues, as it relates to food policy.

It is in this context that TIET in association with Tel-Aviv University (TAU), has set up a new interdisciplinary centre. This centre has brought together researchers from diverse academic disciplines to promote innovative research, forge ties with professionals and academics around the world, and prepare the next generation of scientists and policymakers to guide global food security issues in the years to come. This Centre is co-located on the Patiala campus at TIET and in TAU and has a major partnership with Punjab Agriculture University. This unique centre is already bringing together leading Indian and Israeli scientists and policy experts to further the important field of Food Security.

Objectives

The Centre provides innovative solutions for the critical issue of food security and agricultural development of India and the world at large. The overarching mission of the centre is to link the three collaborating institutions, to foster closer ties at the national level between Israel and India, and to provide a viable interface between industry and academia. The strength of the centre meshes the established Israeli expertise in innovative agriculture and business practices with the growing expertise and abilities of India. These together with the global agriculture industry leadership of the TIET will equip a new generation of specialists, both future academics and industry leaders, with the knowledge to develop and implement a range of innovative solutions for ensuring a sustainable and nutritious supply of food, while preserving the environment and ensure the development of TIET as a national leader in Food Security Studies. The centre will set its sights on becoming a recognized hub for agricultural research, training, and education.

The center works closely with the farmers and villagers. Under this university has established Digital Villages, they develop and provide digital solutions to the farmers. The center also works in the area of enhanced treatment of wastewater without energy investment and biofuel production. Another major area of work under this center is the development of biosensor platforms and the development of affordable processing technologies for the mitigation of post-harvest losses. The following projects are undergoing at the centre: Digital Villages: A Data-Driven Approach to Precision Agriculture in Small Farms, Post harvesting – Biosensor Platforms and Development of affordable Processing Technologies for mitigation of Post-Harvest losses in tropical fruits (GUAVA), Enhanced treatment of wastewater using a synergy of microalgae and microorganisms - without energy investment and biofuel production, and Developing a delivery system of CAS9/gRNA to a tissue culture of wheat and barley for genome editing of agronomic traits.

Centre Of Excellence - Advanced Manufacturing

TIET has agreed to fund a Chair Professor position in Advanced Manufacturing. The Chair is intended to contribute to the development of a research culture at TIET and support the establishment of a Centre of Excellence in TIET. TIET has formally offered the Chair to Prof Noam Eliaz who is an internationally recognized scholar, with an excellent record of collaboration with industry, raising research funding, mentoring of academic staff and post-doctoral researchers, and supervision of research students. The whole emphasis is proposed

to be on applied research working with industry, research laboratories, hospitals, Space Applications.

- Biomedical Applications – Implants, hospitals
- Automotive Applications
- Jewellery
- Space Programs and Defence Labs
- Department of Heavy Industries