









Tata Centre for Technology and Design (TCTD) was established in 2014 at IIT Bombay with support from the Tata Trusts. It was established for the purpose of developing and designing technology solutions to take on the unmet needs of resource-constrained communities within India and across the world.

Objectives

- To explore and develop a program that places heavy emphasis on affordability and performance in the areas of education, healthcare, energy, water, food & agriculture, housing, and waste management.
- To address the challenges faced by resourceconstrained communities within India and across the world by developing appropriate solutions
- To conduct research and offer academic exposure in technology and design to graduate students, by operating as an interdepartmental entity within IITB
- To develop professionals who will be equipped to apply their training in any resourceconstrained setting
- To offer continuing education courses for the working professionals covering different stages of the innovation process

Activities

Work at TCTD, IIT Bombay is around three main functions:

Academic component

TCTD, IIT Bombay enrolls and sponsors M Tech students and PhD scholars as Tata Fellows, every year. These human resources are trained to take up socially relevant challenges through the ProSeminar – the academic program defined for them. This includes:

- Two Seminar-based courses - Technology and Design for End-to-End Innovation

- Lab course on customer discovery interviews, business model canvas, and project-based learning.

These courses help students understand the challenges of designing and implementing technology solutions for the Base of the Pyramid segments. The Centre hopes to train the Tata Fellows into future leaders in engineering and business, who go on to invent technologies and system solutions that serve human needs amidst environmental, social, and political factors.





Research base

Through seed and translational grants, TCTD, IIT Bombay supports research ideas brought in by faculty-led project teams from various departments of the Institute. These collaborative and interdisciplinary project teams design technological interventions for social challenges in the domains of:

- Food & Agriculture
- Energy
- Education
- Healthcare
- Housing
- Water
- Waste Management
- Multidomain

There is the underlying focus on need validation, development of product/process through research, stakeholder analysis, fieldtesting and translation analysis. The progress of the ongoing projects is evaluated at regular intervals and market readiness is charted across solution readiness levels. The number of patent applications from projects at TCTD, IIT Bombay has been growing and a few projects have translated from the lab to the market.

Immersive learning

The Centre looks at various immersive activities that can bring in learning in order to achieve social impact. These include:

- Field visits
- Tata Fellows' Yatra
- TCTD Symposium
- Prototyping competitions Kalpana
- Workshops (End-to-End Innovation
- a five-day workshop)
- Internships

To supplement the learnings from the ProSeminar and aiming to get a community experience of the problems faced by the bottom of the pyramid, students are





taken on field visits. Observing how social and economic progress can be brought about by simple technologies and community-based solutions, the Tata Fellows' Yatra has been a learning experience. The TCTD Symposium has been an annual feature to exhibit the faculty and students' work through posters, prototypes and other media, and to brainstorm on challenges and ideas that drive social innovations ahead. Kalpana, a nationwide prototyping competition has seen a whopping number of applications from all over the country. The five-day program on End to End Innovation has huge demand from the academic and industrial fraternity outside IIT Bombay. Design and engineering students from across India also seek internships regularly as an opportunity to work with the social mandate at TCTD, IIT Bombay.

Facilities

The facilities at TCTD, IIT Bombay are adequately supported by the infrastructures that helps faculty, students, and research teams at building versions of the prototypes round the clock.

Product Realization Lab has Competencies in Design thinking, Design validations and advanced Digital Fabrication tools, Hand tools, Power tools, PCB designing and manufacturing for Rapid Prototyping.

Heavy Fabrication lab has been set up to support the Centre's projects in the Food & Agriculture, Energy, Healthcare, and Waste Management domains, and to accelerate the prototyping and product development process.

Media supports the center projects with all marketing and business materials such as brochures, demo videos, photographs, social media, and promotions.

Outreach team supports the project with need statements, market analysis, lab to market strategies, collaborations, partnerships, business model and commercialization of the tech.

Food processing lab is equipped with sophisticated analytical instruments such as Brunauer-Emmette-Teller (BET), Thermal Analysis (TGA/DSC/DTA), Particle Size Analyser and Bomb Calorimeter to perform detailed analysis.



The Way Ahead

With 19 active projects, TCTD, IITB is looking at translating several of them to the ultimate users through design, business innovation and technology transfer frameworks. At present we have over 6 technology transfers, 7 startups, 28 collaborations, and 11 projects that have received external funding in the different projects in the past years. The Centre is constantly identifying partners who can collaborate with the three broad sets of its activities. The focus is to find the optimum value match with agencies that can add value to the research interests of the IIT Bombay faculty and students, help build a need-finding framework and work together at developing solutions to maximize social impact.



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