

LEAP

Learn Engineering by
Activity with Products

IITM Incubation Cell



ENGINEERING EDUCATION IN INDIA TODAY

India has a very large number of engineering and science graduates. Indian companies provide engineering services globally. However, when it comes to product design and innovative solutions to society's problems, India lags far behind.

This is due in large measure to the limited practical exposure of students in the largely theory-oriented UG teaching in most of our

colleges. Further, many of the teachers have not worked in industry and hence have little practical experience.

Many students do not develop innovative and entrepreneurial mindset. Most of them do not get core engineering jobs, many leave engineering altogether. Out of about 1 million engineers graduating per year in India, over 40% are considered unemployable by Indian industry and over 80% are unemployable in the knowledge industry. We estimate that barely 3-5% are capable of doing innovative design.

LEAP is working towards changing this, making even students from rural engineering colleges capable of doing innovative design.

WHAT INDIAN INDUSTRY NEEDS

Engineering Graduates who can innovate by

- **Understanding Real Life Problems** of the Society
- Having an **Innovative Mindset** for solving Society's problems
- Having **System Design** and **Engineering Skills**
- Being **Delivery Oriented** within given cost and time
- Having **Multi-disciplinary** collaborative **Team Skills**



LEAP IIT-Style Project Based Learning for Engineering Colleges

Project Based Learning (PBL) has been a catalyst in Revolutionizing Engineering Education across the world, including successful programs at Massachusetts USA, MIT USA, IIT Madras and IIT Mandi.

LEAP provides Industry-oriented Project Based Learning to Engineering Colleges by focused programs from 1st Year to 4th Year BE / BTech. All LEAP activities involve building products and learning by doing.

LEAP enables engineering students to work on real-world projects during the semester in their colleges. They work in multi-disciplinary teams to solve real problems of society and deliver working prototypes within given time and cost constraints.



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LEAP CURRICULUM

Year 1: LP101

1st year BE / BTech students learn **Product Design** by **Reverse Engineering** existing products such as a table fan. They then **Enhance the product** with some novel features such as remote control.

Year 2: LP201

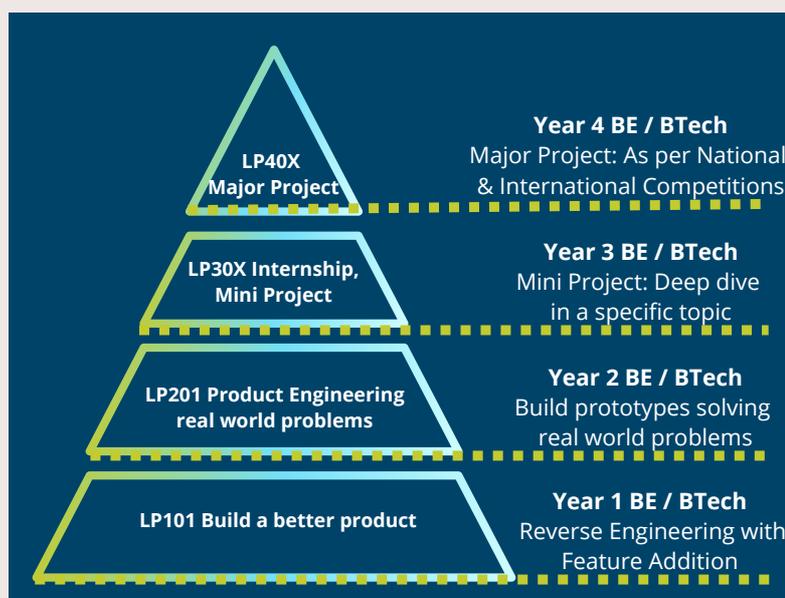
2nd year BE / BTech students learn **Product Engineering** by building **Prototypes** solving **Real-world problems** in different domains including Precision Agriculture, Health Care, Home and Office automation, Aerospace, and more.

Year 3: LP30X

3rd and 4th year BE / BTech students **Deep-dive** in a specific **Topic** by working on a **Mini-Project** based on Real-world problems, e.g. weather forecasting using Timeseries ML models. Students can also join **Industry** offered **Internships** in relevant domains.

Year 4: LP40X

4th Year BE / BTech students work on **Major Projects** in specific domains, aligned to **National and International Competition** needs, e.g. Robotics, Tech Innovations and more. These help students gear towards **Entrepreneurship** and also towards getting relevant **Industry Placements**.



Program Information (LP101 / LP201)

- Team Structure:
 - 4-6 students/team
 - 3 or more disciplines
 - mixed gender
- Project Duration:
 - 8 to 10 weeks
- Hours per week:
 - 8-10 hrs/week for Students
 - 3-4 hrs/week for Faculty
- Institute Support:
 - Faculty nomination for each project
 - Lab resources as per project needs

LP201 SAMPLE PROJECTS

Domains:

- Agriculture Tech, Urban Infrastructure, Home/Office Automation, Personal Devices, Personal Health Tech, Electrical Vehicles, Aerospace and many more

Sample Projects:

- Seed Planter, Automatic Traffic Signal control, Automated Floor Cleaner, Automatic Office Light Control, Smart Cane, Mobile Charger in E-vehicles, Water/Sanitizer spray using Drone, and many more



Seed Planter

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LEAP OUTCOMES

Enhanced Engineering Skills via practical exposure

Certificates for Participating Students and Faculty Members

Top Projects participate in **LEAP Tech competitions** at IITM RP

Probable Internships for **top performers**

Probable funding for **Outstanding projects** from College or IITM Incubation Cell

Certification for qualifying Faculty Members



PROGRAM DELIVERY

LEAP trains and empowers the college faculty who in turn mentor teams of students

- **Faculty Training Workshop** at the start of a program
- **Student sessions** with LEAP experts on need basis
- **Regular connect** with faculty on progress and challenges
- **Open House** for students to present their projects



LEAP BENEFITS

For Students

Acquire **Industry-specific skills** and **Domain Expertise**

Internships/Placements in Core-engineering Companies

Innovative and **Entrepreneurial** mindset in students

Performance based **Grades, Certificate**, and **Probable** Incubation **Funding**

Compete for **Regional, National** and **International Awards**

For Institutes

Evolving Project Based Learning methods in the Institute

Upward trends in Institute Ratings via participation in competitions, enhanced placement prospects of students and incubation of project ideas as startups

Faculty Skill Development - Product Engineering via Practical Exposure

Industry Connect for Faculty and Institute



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LEAP TEAM

Prof Timothy A Gonsalves

Founding Director, IIT Mandi (2010-2020)
Retired from CS&E Dept, IIT Madras

Rolland J. Enoch

Founder, Rishon Comm. Tech Pvt Ltd.

Hema Rani

Sr. Technology and Product Leader
Formerly with C-DOT, Aricent

Jagadeesh Kanna

Founder, Vaayusastra Aerospace Pvt Ltd

Prof L Kannan

Prof of Practice, Engg Design Dept IIT Madras,
Founder, Vortex Engineering

Prof Hitesh Shrimali

Associate Prof School of Computing & EE
IIT Mandi, Himachal Pradesh

Prof S. C. Jain

Emeritus Prof., School of Engineering,
IIT Mandi, Himachal Pradesh

+ other Mentors from IITs, and Industry

MOU AND COMMERCIALS

MoU and Commercials with LEAP - IITM Incubation Cell

Commercials:

- **Fixed fees per course*** based on batch size
- **Material cost** based on the projects
- **Actuals for visits** by LEAP experts

* Contact LEAP for Pricing



LEAP PARTNERS



Maker Bhavan Foundation

(MBF), USA is the Founding
Partner for LEAP Program.

MBF is a Charitable Foundation enabling Science
Technology Engineering and Math (STEM)
education and research, with a mission to unlock
the transformative potential of engineering
education in jumpstarting innovation in India.

LEAP, Jan 2023

LEAP Industry Partners

LEAP is partnering with Companies/Industries
across different domains.

LEAP Industry partners collaborate on various
aspects related to LEAP, e.g. Internships,
Placements, Domain Specific Projects, LEAP
volunteer support for different roles including
Advisors, Judges and more.

