LEAP

Learn Engineering by Activity with Products

IITM Incubation Cell

The Future for Science Graduates

In the fast-evolving technology-driven world, the future for science graduates is undergoing rapid changes. Traditional roles are fading, replaced by new opportunities driven by technology and widespread gadget use. For example, for design of new materials with specific properties, automated experiments with vast amount of data, combined with the use of Artificial Intelligence (AI) and Machine Learning (ML) is replacing traditional lab work.

The current theoretical education system does not fully meet the needs of this dynamic employment landscape. Graduates often encounter a gap as their education does not equip them with the skills required for life-long adaptation and change.

LEAP, with its focus on practical, real-world skills, bridges this gap, uniquely preparing students for future challenges.

Why LEAP for STEM students?

India needs graduates who can tackle India's pressing problems

- **Understanding of Problems** of the Society
- An **Innovative Mind-set** to solve Society's problems
- **Holistic understanding**, scientific, technical and soft Skills
- **Delivery Oriented** within given cost and time
- **Team Skills**, multi-disciplinary collaboration

LEAP to the rescue

- Based on decades of experience in IITs
- Project-based learning with Inter-disciplinary scope: Given a real-world need, find a good solution
- Experiential learning: Learn by doing, a recipe for lifelong adaptability
- Demystify technology, dispel fear
- Develop an innovative way of thinking

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LEAP Curriculum

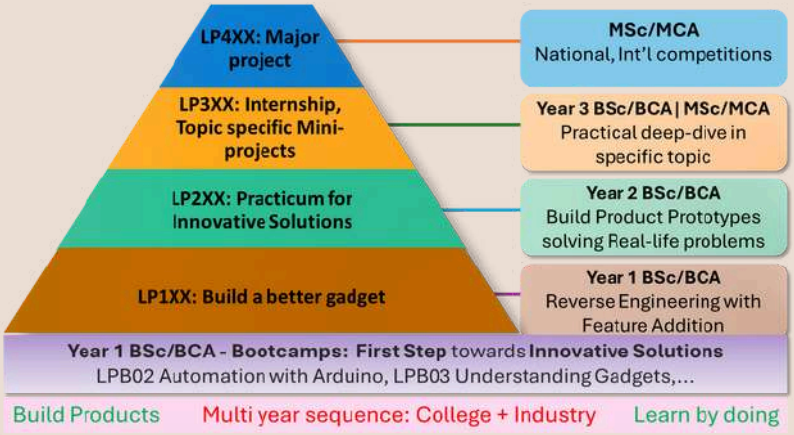
Year 1: LPB02 Bootcamp | Automation with Arduino
1st year BSc / BCA students are introduced to **embedded systems** programming using Arduino. They learn about **automation with Arduino** in various domains including home automation, healthcare, agriculture and more. Duration: 2-3 days.

Year 1: LPB03 Bootcamp | Understanding Gadgets
1st year BSc / BCA students Understand Gadgets by **Reverse Engineering** the existing gadgets such as a table fan and foster critical thinking skills by developing a troubleshooting guide. Duration: 2-3 days.

Year 1: LP1XX | Build a Better Gadget
1st year BSc / BCA students Understand Gadgets by Reverse Engineering the existing gadgets such as a table fan. They then **enhance the gadget** with some novel features such as remote control. Duration: 9 weeks.

Year 2: LP2XX | Practicum for Innovative Solutions
2nd year BSc / BCA students learn Innovation techniques by building **Prototypes solving Real-world problems** in different domains including Precision Agriculture, Health Care, Home and Office automation, Aerospace, and more. Duration: 11 weeks.

Year 3: LP3XX | Domain-specific Mini-projects
Senior year BSc / BCA, MSc / MCA students **Deep-dive in a specific Topic** by working on a **Mini-Project** based on Real-world problems, e.g. object detection using image processing, computer vision and machine learning techniques. Students can also join Industry offered **Internships** in relevant domains. Duration: 4-10 weeks.



LP4XX | Major technical project
MSc / MCA students work on Major Projects in specific domains, aligned to **National and International Competition** needs, e.g. Robotics, Innovations and more. These help students gear towards **Entrepreneurship** and also towards getting relevant **Industry Placements.** Duration: 1-2 semesters.

Program Information

- Team Structure:
  - 4-6 students/team
  - 3 or more disciplines
  - mixed gender
- Hours per week:
  - 6-8 hrs/week for Students
  - 2-3 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:

- Air-Conditioned Helmet, Vehicle Accident Alert, Automated headlight dimmer, Medicine reminder, Smart Hand-washing Dispenser, Fire Surveillance robot, Automatic CO gas detector for car cabinet and opening windows, Fluorotronix-based Plantation and many more

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LEAP Benefits

For Students

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

Internships/Fellowships/Placements in relevant 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

Faculty Skill Development - Innovative Solutions via Practical Exposure

Industry Connect for Faculty and Institute

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

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

MoU and Commercials

MoU and Commercials with LEAP - IITM Incubation Cell

Commercials:

- LEAP membership fee*
- LEAP Program specific fee*
- Material cost based on the projects
- Actuals for visits by LEAP experts

* Contact LEAP for Pricing

2023

1500+ Students
160+ Faculty
60+ Projects

2024

11,500+ Students
600+ Faculty
550+ Projects

LEAP Team

- Led by: Prof Timothy A Gonsalves, Founding Director, IIT Mandi (2010-2020)
- Core team: IIT Faculty and Alumni, Entrepreneurs and Industry Veterans
- Mentors: From IITs, Industry, etc.

LEAP Founding Partner

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

MBF is the strategic partner for LEAP. It is a Charitable Foundation enabling Science Technology Engineering and Math (STEM) education and research. Its mission is to unlock the transformative potential of engineering education to jumpstart innovation in India.

LEAP Industry Associates

Companies across different domains are partners with LEAP. They collaborate in various ways, e.g. Internships, Placements, Domain Specific Projects. Their staff volunteer for different roles including Advisors, Judges and more. Industry associates also support LEAP programs via CSR funding.

LEAP Knowledge Partners

Trivandrum Chapter

LEAP Academic Partners

- Dr. G R Damodaran College of Science, Coimbatore
- Government Engineering College, Idukki
- Government College of Engineering, Tirunelveli
- Prince Shri Venkateshwara Padmavathy Engineering College, Chennai
- Prince Dr. K. Vasudevan College of Engineering and Technology, Chennai
- Ramco Institute of Technology, Rajapalayam
- Sree Chitra Thirunal College of Engineering, Thiruvananthapuram
- Sri Sai Ram Engineering College, Chennai
- Sri Sai Ram Institute of Technology, Chennai
- Nehru Institute of Engineering and Technology, Coimbatore
- Nehru Institute of Technology, Coimbatore
- Francis Xavier Engineering College, Tirunelveli

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