Innovations in Teaching-Learning

The department actively implements innovative and ICT-based teaching-learning practices to improve student engagement, knowledge retention, conceptual clarity, and practical exposure. These methods are aligned with the dynamic needs of engineering education and aim to make learning more interactive, application-oriented, and outcome-based.

Our innovative practices include

1. Technology-Enhanced Learning Tools

- Integration of digital platforms such as LMS (e.g., vishnulearning.com) to manage content, track progress, and enable self-paced learning.
- Use of online simulations, educational software, and animation tools for visualizing complex engineering phenomena.
- Use of multimedia classrooms to support interactive instruction.

2. Flipped and Blended Learning Models

- Flipped Classroom: Instructional content is delivered outside class through videos and presentations; class time is used for discussions and problem-solving.
- Blended Learning: Combines traditional teaching with online resources like NPTEL, SWAYAM, and faculty-recorded lectures for enhanced flexibility and reach.

3. **Visualization-Based and Multimedia Learning**

- Use of PowerPoint presentations, animations, and video demonstrations to explain abstract engineering concepts.
- Faculty-developed YouTube channels and self-recorded lectures to support revision and remote access.

4. **Project-Based and Experiential Learning**

- Emphasis on project-based, problem-based, and case-based learning to encourage application of theoretical concepts.
- Involvement in live projects, design challenges, and industry-linked problem statements.
- Hands-on activities in labs and workshops foster practical exposure and team collaboration.

5. **Collaborative and Peer Learning**

- Encouragement of collaborative tasks, peer teaching, and role plays within the curriculum.
- Enhances soft skills, communication, and confidence while preparing students for real-world team dynamics.
- Collaborative learning is embedded into labs, tutorials, and classroom interactions.

6. **Innovative Assessment Techniques**

- Use of continuous evaluation, peer assessment, and formative feedback to track learning outcomes.

- Digital assessment tools like LMS quizzes, Kahoot, and Plickers are used to make assessments more engaging and responsive.
- Mapping of assessments with Course Outcomes (COs) for effective learning analytics.

7. Customization for Diverse Learners

- Use of multimedia presentations and interactive content to cater to different learning styles.
- Support through remedial programs, tutorial sessions, and capstone projects for struggling learners.
- Advanced learning tracks like honors and minor programs for high-performing students to explore interdisciplinary interests.

8. **Integration with Industry and Research**

- Frequent guest lectures, webinars, and workshops by industry professionals and domain experts.
- Student participation in faculty-led research projects, innovation challenges, and technical paper presentations.
- Exposure to industry-relevant tools, practices, and technologies through collaborative platforms.

9. **Interdisciplinary and Multidisciplinary Approaches**

- Development of courses that integrate concepts from multiple engineering domains for solving complex, real-world problems.
- Availability of interdisciplinary electives and joint projects with other departments.
- Encouragement for innovation through team-based, cross-functional activities.

The activities can be reproduced by following the procedure.

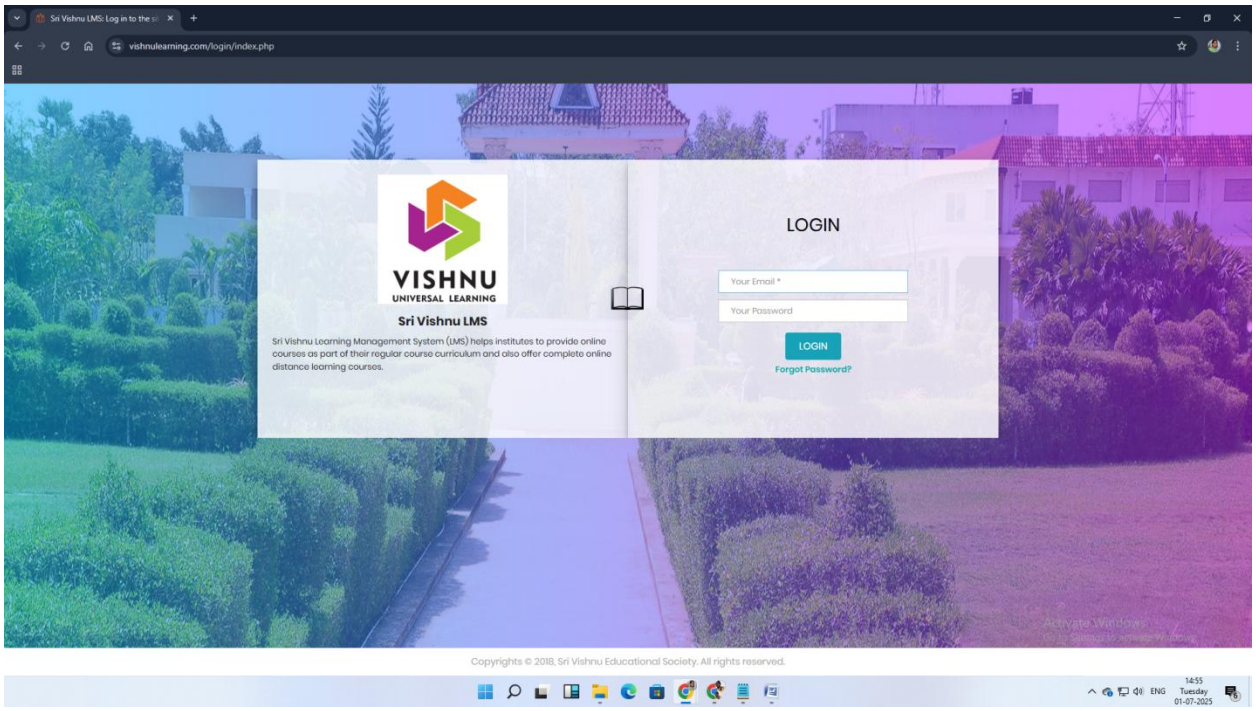

Fig: Learning Management System adopted by department

Fig. Activity based learning

Fig. Collaborative Learning

Fig: Collaborative Learning

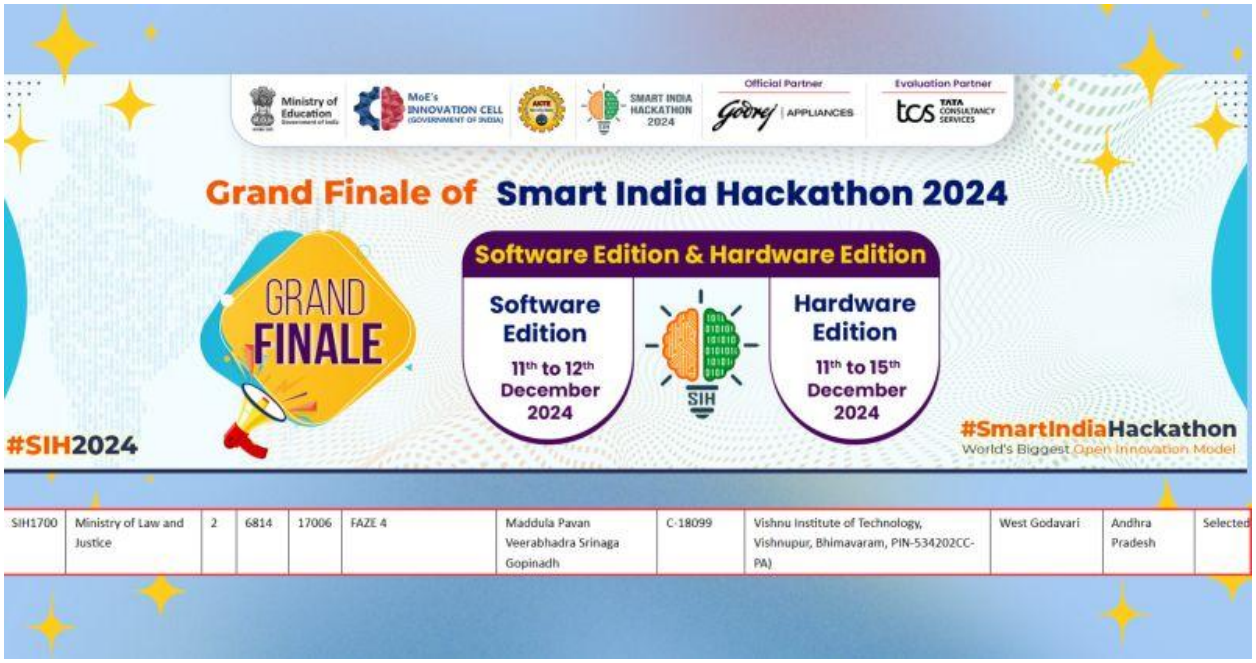

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Fig: Encouragement for Innovation (Grand Finalists of SIH 2024)

Fig. Research Publications by students

Fig: Student participation in faculty-led research projects, innovation challenges, and technical paper presentations

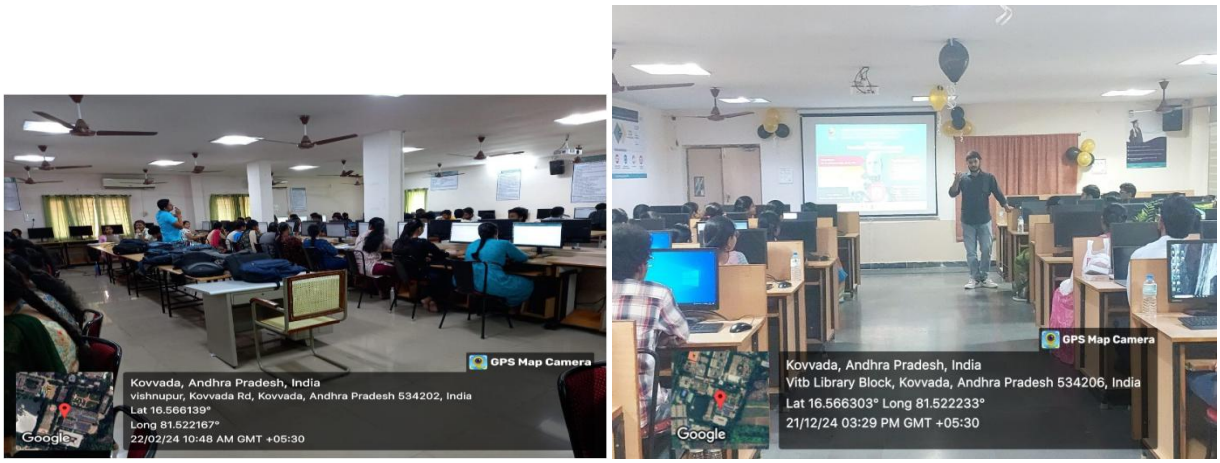


Fig. Guest Lectures, webinars, workshops by industry professionals.

Fig. Industry sponsored workshops

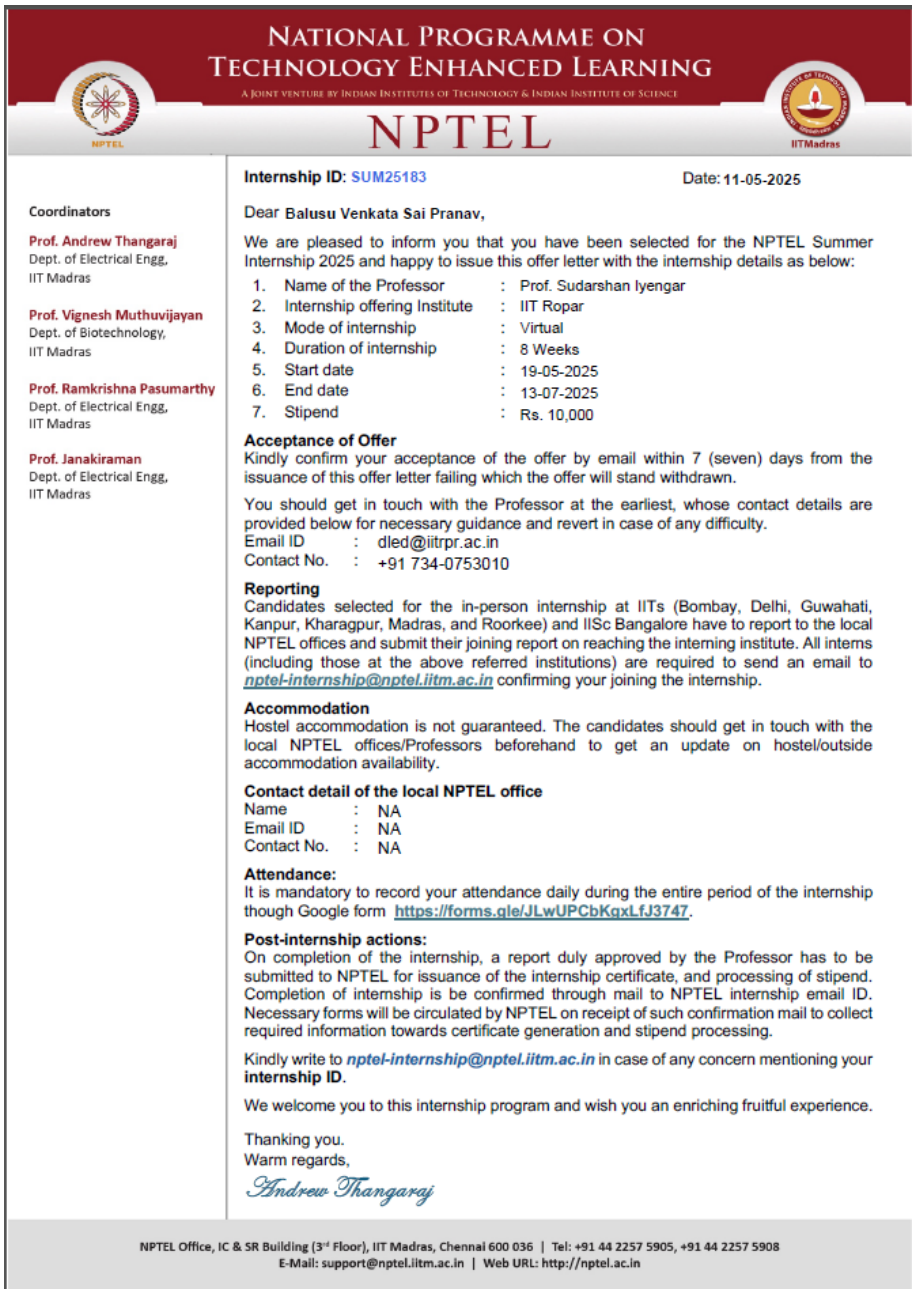
Hackathons are organized in-house based on industry problems, and also to prepare students for participation in top-level competitions.

Fig: Hackathons on Industry Problems

Fig. SIH 2024 Finalists

Students are actively enrolling in NPTEL courses and consistently earning topper badges. Notably, two students secured summer internship opportunities at IIT Ropar through their NPTEL performance. Faculty members are continuously motivating students to take up MOOCs and are mentoring them to build strong domain knowledge. Their dedicated efforts have also been recognized with 'Top Performing Mentor' badges.

Fig: Toppers of NPTEL courses.



NATIONAL PROGRAMME ON TECHNOLOGY ENHANCED LEARNING

A JOINT VENTURE BY INDIAN INSTITUTES OF TECHNOLOGY & INDIAN INSTITUTE OF SCIENCE

NPTEL

Coordinators

Prof. Andrew Thangaraj
Dept. of Electrical Engg,
IIT Madras

Prof. Vignesh Muthuvijayan
Dept. of Biotechnology,
IIT Madras

Prof. Ramkrishna Pasumarthy
Dept. of Electrical Engg,
IIT Madras

Prof. Janakiraman
Dept. of Electrical Engg,
IIT Madras

Internship ID: SUM25183 Date: 11-05-2025

Dear **Balusu Venkata Sai Pranav,**

We are pleased to inform you that you have been selected for the NPTEL Summer Internship 2025 and happy to issue this offer letter with the internship details as below:

1. Name of the Professor : Prof. Sudarshan Iyengar
2. Internship offering Institute : IIT Ropar
3. Mode of internship : Virtual
4. Duration of internship : 8 Weeks
5. Start date : 19-05-2025
6. End date : 13-07-2025
7. Stipend : Rs. 10,000

Acceptance of Offer
Kindly confirm your acceptance of the offer by email within 7 (seven) days from the issuance of this offer letter failing which the offer will stand withdrawn.

You should get in touch with the Professor at the earliest, whose contact details are provided below for necessary guidance and revert in case of any difficulty.
Email ID : dled@iitrpr.ac.in
Contact No. : +91 734-0753010

Reporting
Candidates selected for the in-person internship at IITs (Bombay, Delhi, Guwahati, Kanpur, Kharagpur, Madras, and Roorkee) and IISc Bangalore have to report to the local NPTEL offices and submit their joining report on reaching the interning institute. All interns (including those at the above referred institutions) are required to send an email to *nptel-internship@nptel.iitm.ac.in* confirming your joining the internship.

Accommodation
Hostel accommodation is not guaranteed. The candidates should get in touch with the local NPTEL offices/Professors beforehand to get an update on hostel/outside accommodation availability.

Contact detail of the local NPTEL office
Name : NA
Email ID : NA
Contact No. : NA

Attendance:
It is mandatory to record your attendance daily during the entire period of the internship though Google form https://forms.gle/JLwUPCbKqxLfJ3747.

Post-internship actions:
On completion of the internship, a report duly approved by the Professor has to be submitted to NPTEL for issuance of the internship certificate, and processing of stipend. Completion of internship is be confirmed through mail to NPTEL internship email ID. Necessary forms will be circulated by NPTEL on receipt of such confirmation mail to collect required information towards certificate generation and stipend processing.

Kindly write to ***nptel-internship@nptel.iitm.ac.in*** in case of any concern mentioning your **internship ID**.

We welcome you to this internship program and wish you an enriching fruitful experience.

Thanking you.
Warm regards,
Andrew Thangaraj

NPTEL Office, IC & SR Building (3rd Floor), IIT Madras, Chennai 600 036 | Tel: +91 44 2257 5905, +91 44 2257 5908
E-Mail: support@nptel.iitm.ac.in | Web URL: http://nptel.ac.in

Fig. Summer Internship Offer Letter

Fig. Top Performing Mentor recognitions

The department continuously evolves its teaching-learning ecosystem by leveraging technology, experiential strategies, and real-world context. These efforts ensure students not only grasp engineering fundamentals but also become industry-ready, innovative problem solvers.
Images: