

Labs Developed by IIT Roorkee

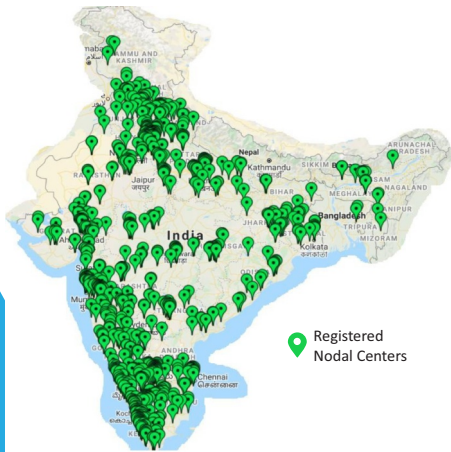
IIT Roorkee has developed the following Virtual Labs under NMEICT:

Central Portal: www.vlab.co.in

IITR Portal: www.vlab.iitr.ac.in

- Electrical Machines Lab
- Surveying Lab
- Biomedical Instrumentation Lab
- Bio-Medical Signal & Image Processing Lab
- Digital Electronics Lab-I
- Analog Electronics Lab
- Electrical Measurements Lab
- Analog and Digital Electronics Lab-I
- Analog and Digital Electronics Lab-II
- Basic Electrical Science Lab
- Microwave Engineering Lab
- Optical Communication Lab

Glimpses



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VIRTUAL LABS

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VIRTUAL LABS

An Initiative of Ministry of Education under the
National Mission on Education through ICT



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The Philosophy

Good lab facilities and updated lab experiments are critical for any science and engineering Institutes/colleges. Paucity of lab facilities often make it difficult to conduct experiments. Also, good teachers are always a scarce resource. The Virtual Labs project addresses this issue of lack of good lab facilities, as well as trained teachers, by providing remote-access to simulation-based labs in various disciplines of science and engineering. Yet another objective is to arouse the curiosity of the students and permit them to learn at their own pace. This student-centric approach facilitates the absorption of basic and advanced concepts through simulation-based experimentation. Internet-based experimentation further permits use of additional web-resources, video-lectures, animated demonstration, and self-evaluation.

Specifically, the Virtual Labs addresses the following:

- Access to online labs to those science and engineering Institute/colleges that lack these lab facilities.
- Access to online labs as a complementary facility to those Institute/colleges that already have labs.
- Training and skill augmentation through on-site and/or online workshops.
- Virtual Labs are available at any place and at any time.
- It is a paradigm shift for student-centric, online education.

About Virtual Labs

Virtual Labs is a venture of Ministry of Education (MoE), Govt. of India, under the National Mission on Education through Information and Communication Technology (NMEICT) program. This project is set up with a motive of improving standards of laboratory and practical training imparted to engineering and science students in India. In this program, the state of art laboratory facilities in all disciplines of engineering and science education are developed in few chosen specific Institutions. These laboratory facilities are then virtualized by using internet and other related technologies. These Virtual Labs are available on common portal, <http://www.vlab.co.in/>. Student can access lab of his/her choice and perform experiments at a convenient/preferred time slot. He/she can also repeat experiment as many times as he/she wishes. The experimentation and learning process is further strengthened by the detailed instructions, theory and analysis given with each experiment.

Potential Beneficiaries of the Virtual Labs

The intended beneficiaries of the Virtual Labs experiments are expected to be:

1. All students and faculties of science and engineering Institutes/ colleges who do not have access to good lab facilities and/or instruments.
2. High school students, whose inquisitiveness will be triggered, possibly motivating them to take up higher studies.
3. Researchers in different Institutes/colleges who can collaborate/share equipment and resources.
4. Different engineering Institutes/colleges, who can benefit from the content and related teaching resources.

Virtual Labs Activities

Two types of activities are conducted under Virtual Labs:

Outreach Activities

Outreach activities cover organization of on-site and/or on-line workshops aimed to provide a minimum level of training to the faculties/students/research scholars in engineering and science Institutes/colleges. The primary objective of these workshops is to enhance theoretical and practical knowledge of faculties/students/research scholars. These workshops also provide an opportunity to faculties/students/research scholars to interact with experts from the specific fields, where they can discuss relevant topics of the particular subjects in deep. Workshops provide a distinct learning environment compared to traditional classroom, where students learn more effectively and efficiently at their own pace which boosts their confidence, performance, and productivity.

Simulated Experiments Development Activities

Online and on-site bootcamps, internship and faculty development programs are organized to aware the faculties and students about the development of web enabled quality labs. The primary objective of these programs is to include registered nodal center(s) in development of the various labs. The developers of the Virtual Labs provide valuable insights into designing, building, and implementing the technology to simulate real-world environments in a virtual setting. Developers also guide the participants at every step, sharing their technical knowledge and expertise. This support helps participants gain an understanding of how to use various tools and libraries when developing new labs. Additionally, they review code written by participants and provide feedback to assist them in producing quality work. Upon successful completion of these program, participants are provided a certificate in recognition to their hard work and knowledge they have acquired.