

VIRTUAL LABS

Virtual Labs project is an initiative of Ministry of Human Resource Development (MHRD), Government of India under the aegis of National Mission on Education through Information and Communication Technology (NMEICT). This project is a consortium activity of twelve participating institutes and IIT Delhi is coordinating institute. It is a paradigm shift in ICT-based education. For the first time, such an initiative has been taken-up in remote-experimentation. Under Virtual Labs project, over 120 Virtual Labs consisting of approximately 900+ web-enabled experiments were designed for remote-operation and viewing.

Virtual Labs have been designed to provide remote access to labs in various disciplines of Science and Engineering. These Virtual Labs cater to students at the undergraduate level, post graduate level as well as to research scholars. Virtual Labs enable the students to learn at their own pace and enthuse them to conduct experiments. Virtual Labs also provide a complete learning management system where the students can avail various tools for learning, including additional web-resources, video-lectures, animated demonstrations and self evaluation. Virtual Lab enables the user to perform experiments remotely as an on-demand service over the web. The Virtual Labs are being jointly developed by IIT Delhi, IIT Bombay, IIT Madras, IIT Guwahati, IIT Roorkee, IIT Kanpur, IIT Kharagpur, IIIT Hyderabad, Amrita Vishwa Vidyapeetham Coimbatore, College of Engineering Pune, Dayalbagh Educational Institute Agra and NITK Surathkal.

Objectives:

1. To provide remote-access to Labs in various disciplines of Science and Engineering. These Virtual Labs would cater to students at the undergraduate level, post graduate level as well as to research scholars.
2. To enthuse students to conduct experiments by arousing their curiosity. This would help them in learning basic and advanced concepts through remote experimentation.
3. To provide a complete Learning Management System around the Virtual Labs where the students can avail the various tools for learning, including additional web-resources, video-lectures, animated demonstrations and self evaluation.
4. To share costly equipment and resources, which are otherwise available to limited number of users due to constraints on time and geographical distances.

Salient Features:

1. Virtual Labs will provide to the students the result of an experiment by one of the following methods (or possibly a combination)
 - Modeling the physical phenomenon by a set of equations and carrying out simulations to yield the result of the particular experiment. This can, at-the-best, provide an approximate version of the 'real-world' experiment.
 - Providing measured data for virtual lab experiments corresponding to the data previously obtained by measurements on an actual system.
 - Remotely triggering an experiment in an actual lab and providing the student the result of the experiment through the computer interface. This would entail carrying out the actual lab experiment remotely.
2. Anytime anywhere lab
3. Virtual Labs are free to use
4. Accessible through internet on any PC/Laptop/Tablet/Smartphone
5. Developed in self-learning mode
6. Innovative experimentations
7. Over 120 Virtual Labs have already been developed
8. Virtual Labs will be made more effective and realistic by providing additional inputs to the students like accompanying audio and video streaming of an actual lab experiment and equipment.

Broad Areas of Virtual Labs:

- Civil Engineering
- Electrical Engineering
- Mechanical Engineering
- Electronics & Communications
- Computer Science & Engineering
- Chemical Engineering
- Biotechnology and Biomedical Engineering
- Physical Sciences
- Chemical Sciences

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