

VIRTUAL LABS

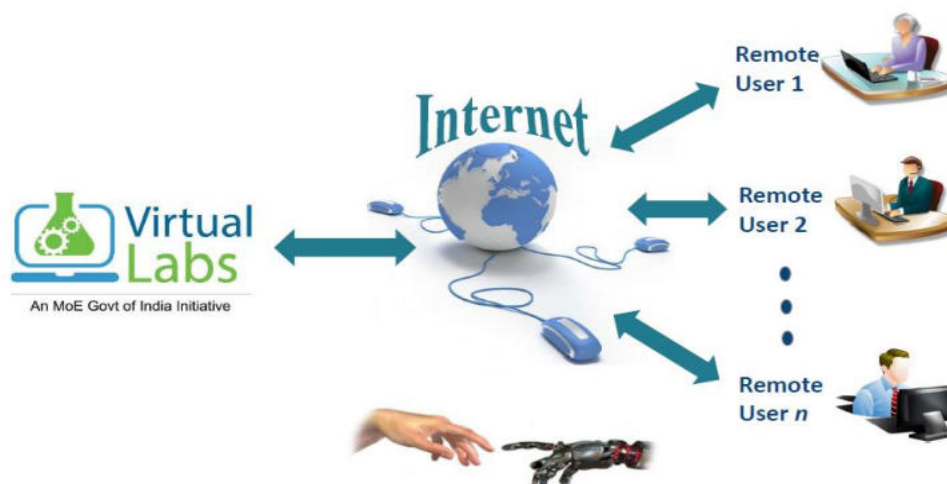
Annamacharya Institute of Technology and Sciences (AITS), Rajampet, serves as a Nodal Center (NC-ID-2640) for Virtual Labs, an initiative by the Ministry of Education (MoE), Government of India, under the National Mission on Education through ICT (NMEICT). As a nodal center, AITS facilitates the implementation and promotion of Virtual Labs developed by premier institutes such as IITs and IIITs, enabling students and faculty to perform experiments online in various domains of science and engineering. The Virtual Labs platform provides remote access to laboratory experiments in disciplines like electronics, electrical, computer science, mechanical, and civil engineering. Through this initiative, AITS Rajampet encourages experiential learning beyond physical boundaries, supports innovation in teaching methodologies, and helps students gain hands-on exposure to experimental procedures using a simulated, interactive environment. Regular workshops, awareness programs, and training sessions are conducted at AITS Rajampet to train students and faculty on using Virtual Labs effectively, thereby enhancing practical learning outcomes and promoting the integration of digital tools in technical education.

Virtual Labs project is an initiative of Ministry of Education (MoE), 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 100 Virtual Labs consisting of approximately 700+ web-enabled experiments were designed for remote-operation and viewing.

The intended beneficiaries of the projects are:

- All students and Faculty Members of Science and Engineering Colleges who do not have access to good lab-facilities and/or instruments.
- High-school students, whose inquisitiveness will be triggered, possibly motivating them to take up higher-studies. Researchers in different institutes who can collaborate and share resources.
- Different engineering colleges who can benefit from the content and related teaching resources.

Virtual Labs do not require any additional infrastructural setup for conducting experiments at user premises. The simulations-based experiments can be accessed remotely via internet.



Objectives

1. To provide remote-access to simulation-based Labs in various disciplines of Science and Engineering.
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/ teachers can avail the various tools for learning, including additional web-resources, video-lectures, animated demonstrations and self-evaluation.

Participating Institutes in Virtual Labs Initiative

The Virtual Labs initiative is a collaborative program under the National Mission on Education through ICT (NMEICT), Ministry of Education, Government of India, aimed at providing remote-access, simulation-based laboratories to students across India. Several prestigious technical and research institutes actively participate in this program as content developers, mentors, and coordinators, contributing their expertise in experimental and practical learning.

The participating institutes include:

1. IIT Kharagpur – Pioneer in developing virtual labs for electronics, computer science, and engineering disciplines.
2. IIT Roorkee – Provides comprehensive virtual labs in analog & digital electronics and engineering fundamentals.
3. IIT Guwahati – Focuses on digital electronics, embedded systems, and sequential circuit experiments.
4. IIT Delhi – Contributes virtual modules for advanced engineering simulations and interdisciplinary experiments.
5. IIT Bombay – Offers digital applications, logic design, and combinational & sequential circuit labs.
6. IIT Kanpur – Provides experimental platforms in electronics, physics, and systems engineering.
7. IIIT Hyderabad – Specializes in VLSI design, Verilog-based digital logic design, and microelectronics virtual labs.
8. Amrita Vishwa Vidyapeetham – Develops virtual lab content for biotechnology, biomedical engineering, and basic electronics.
9. Dayalbagh Educational Institute – Supports virtual experiments in physical and chemical sciences, promoting hands-on learning.
10. NITK Surathkal – Focuses on VLSI testing and design verification virtual labs.
11. COEP Technological University, Pune – Provides virtual labs in embedded systems, hybrid electronics, and microcontroller programming.

These institutes collaboratively ensure accessibility, quality, and academic rigor in virtual laboratory experiments, enabling students across the country to gain practical exposure remotely, enhance technical skills, and foster innovation in learning methodologies.

Broad Areas of Virtual Labs

Virtual Labs provide interactive, simulation-based platforms for students to perform experiments and understand core engineering and science concepts remotely. The following are the broad areas covered under the Virtual Labs initiative, which support the practical learning needs of students across multiple disciplines:

Electronics & Communication Engineering

Virtual Labs in this area enable students to design, simulate, and analyze electronic circuits, communication systems, and signal processing experiments. Learners can perform experiments on amplifiers, filters, modulation techniques, and digital communication systems using virtual instrumentation.

Computer Science & Engineering

These labs focus on algorithm design, data structures, networking, database systems, and operating systems. Students can implement and test software programs, simulate network protocols, and understand system-level functionalities in an interactive, online environment.

Electrical Engineering

Virtual experiments include topics like circuit analysis, control systems, electrical machines, and power electronics. Students can simulate load characteristics, test machine parameters, and visualize control responses without needing physical hardware setups.

Mechanical Engineering

Mechanical Virtual Labs allow learners to explore thermodynamics, fluid mechanics, material testing, kinematics, and machine design. They help visualize forces, motion, and system behavior through simulation tools that replicate real-life mechanical systems.

Chemical Engineering

These labs focus on process dynamics, reaction kinetics, heat and mass transfer, and fluid flow in chemical processes. Students can model and analyze industrial chemical processes and understand plant operations virtually.

Biotechnology and Biomedical Engineering

Virtual Labs provide simulated environments to study cell biology, genetics, bioprocess engineering, biomedical instrumentation, and physiological signal measurement, promoting safe and accessible experimentation in life sciences.

Civil Engineering

Experiments in this area cover structural analysis, geotechnical engineering, transportation, environmental engineering, and fluid mechanics. Virtual simulations help students understand stress distribution, soil behavior, and material properties effectively.

Physical Sciences

Virtual Labs in physics enable students to perform optics, mechanics, electromagnetism, and modern physics experiments. Simulations enhance conceptual clarity and bridge the gap between theoretical and experimental physics.

Chemical Sciences

Chemistry Virtual Labs provide hands-on exposure to experiments in physical, organic, and inorganic chemistry. Students can safely perform titrations, chemical kinetics, spectroscopy, and qualitative analysis through interactive simulations.

Virtual labs–Composition of Members

NCID: 2640

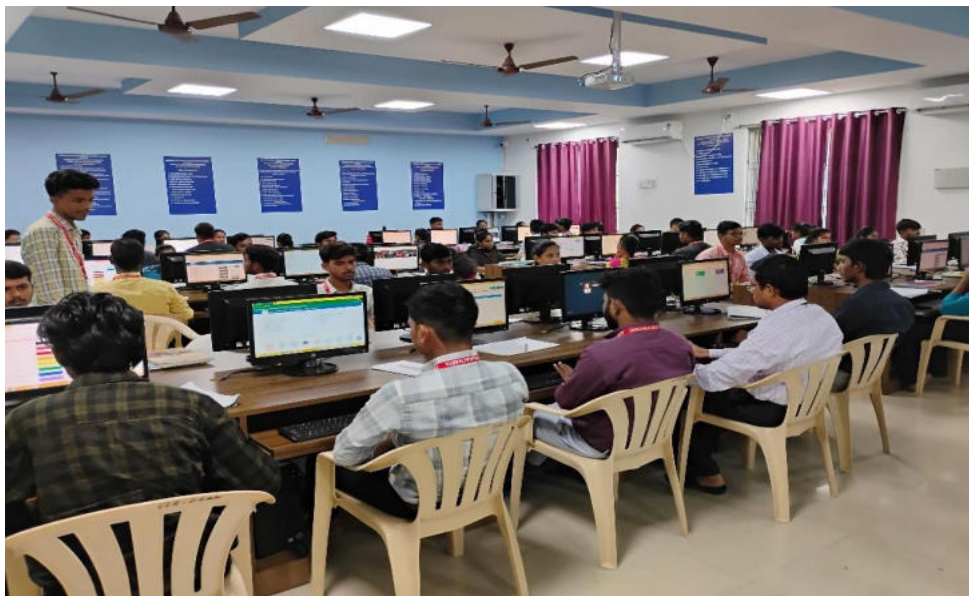
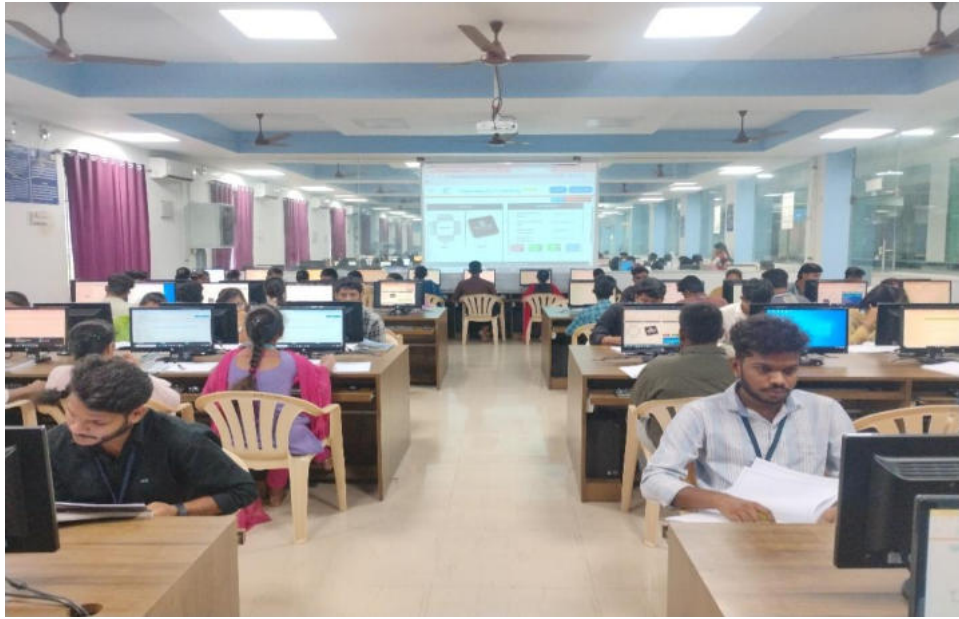
S.No.	Name of the Member	Role and Department
1.	Dr. K Riyazuddin	Nodal Coordinator- Virtual Labs
Departmental Coordinators		
2.	Anil Kumar	Coordinator - CIVIL
3.	K Nagamani	Coordinator - ME
4.	A Hari	Coordinator –ECE

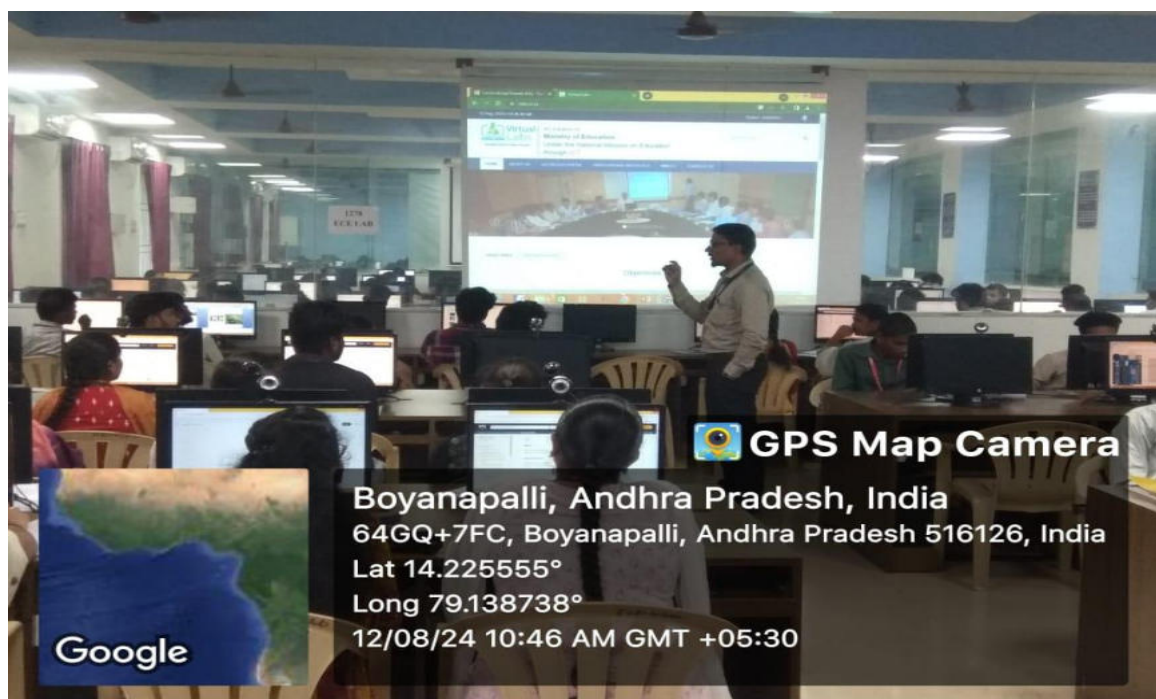
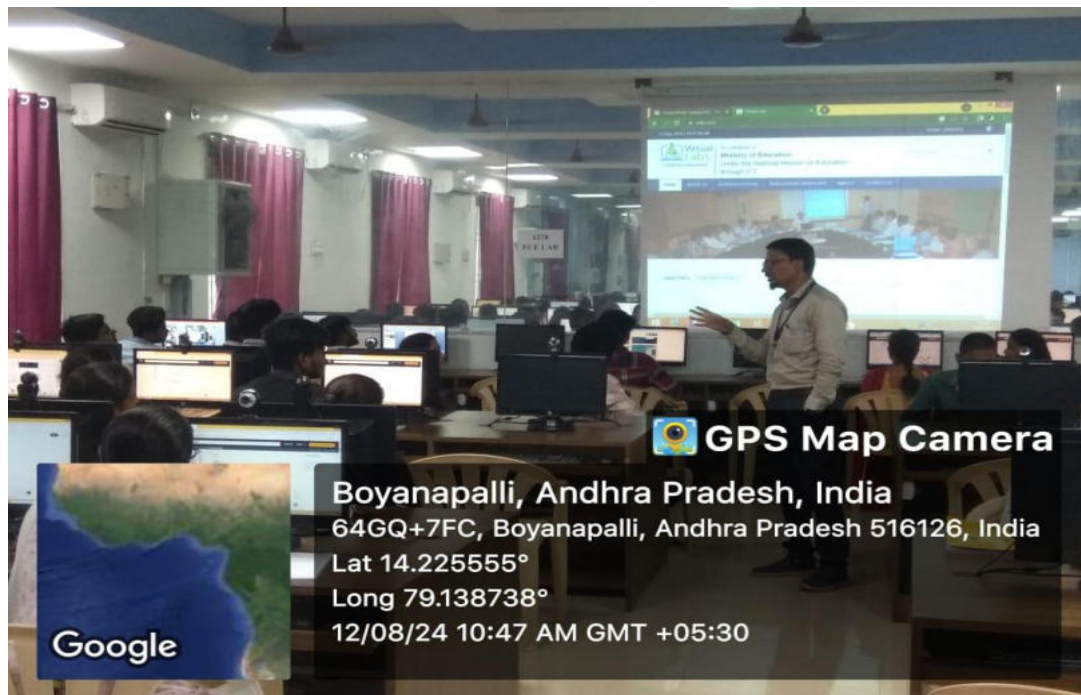
Institution Event Details

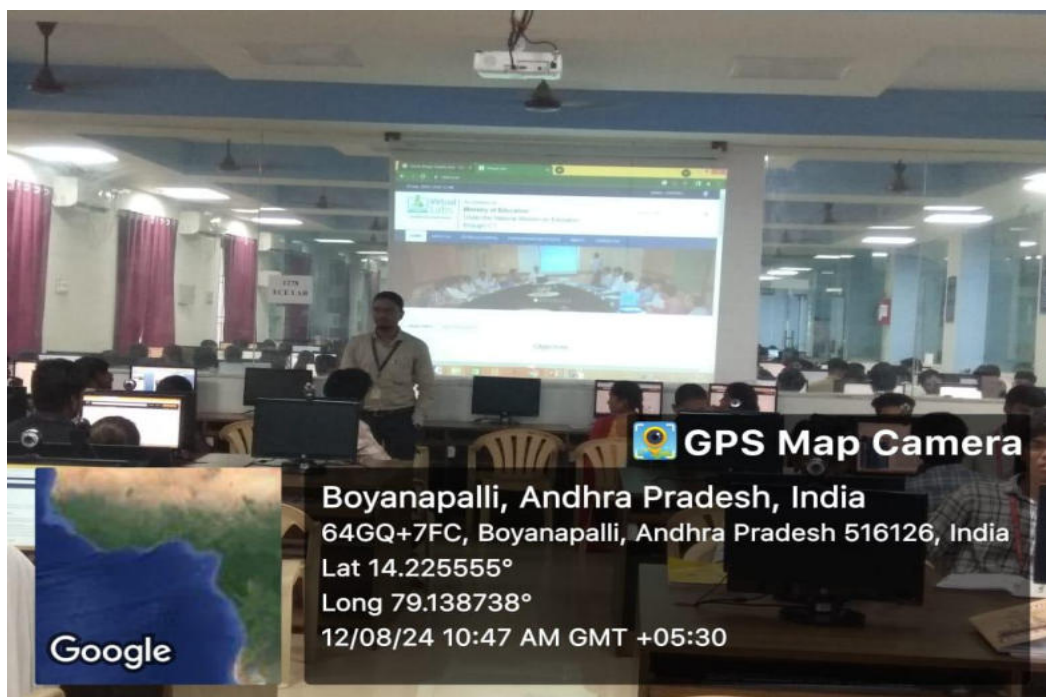
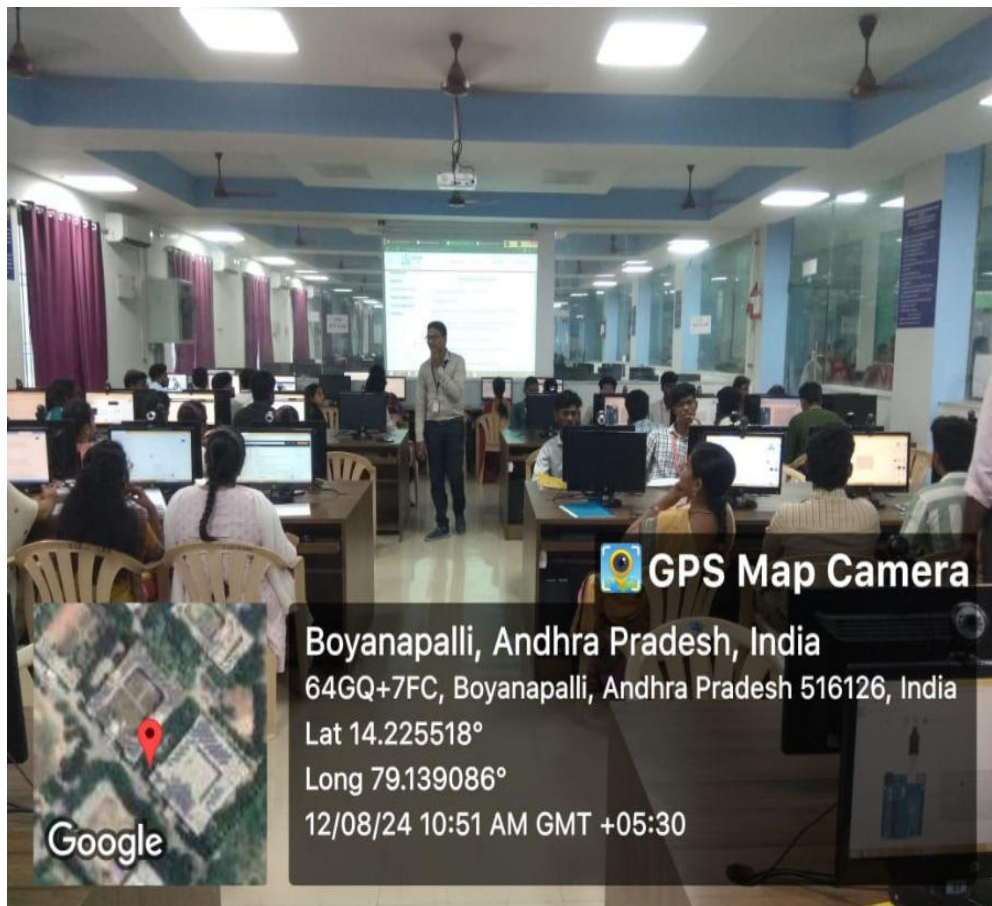
S.No	Date of conduction	Number of labs conducted	Usage recorded	Number of Students
1	10/09/2025	4	2030	53
2	09/23/2025	4	1794	50
3	09/15/2025	1	246	45
4	08/01/2025	1	611	93
5	10/28/2024	1	2623	193
6	8/12/2024	1	416	41

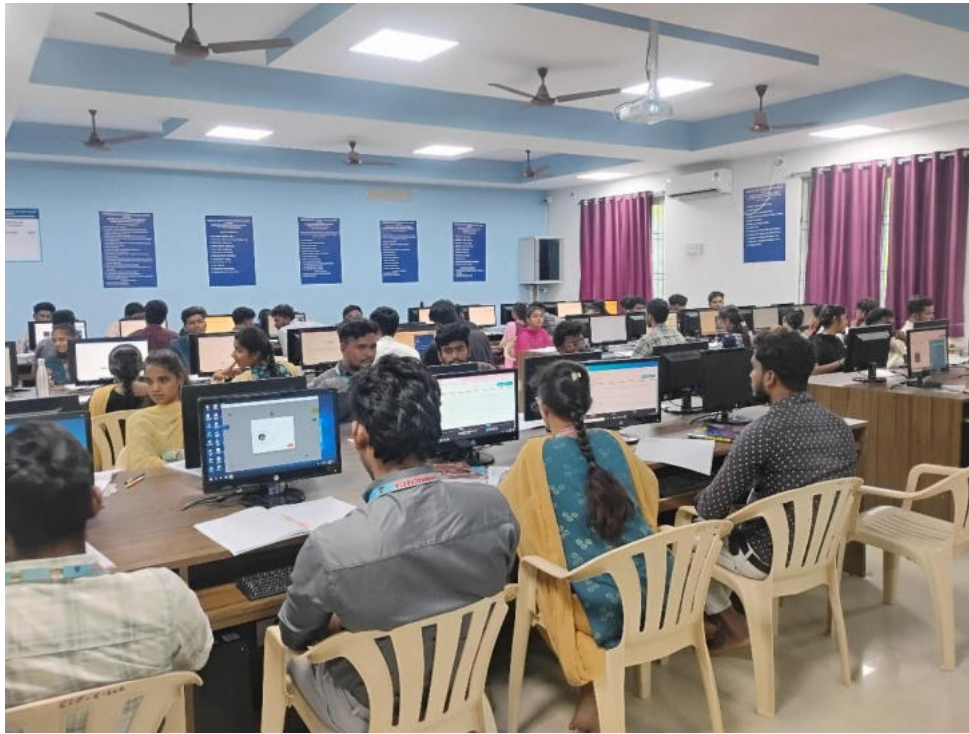
GLIMPSES OF VIRTUAL LABS

STUDENTS PERFORMING EXPERIMENTS USING VIRTUAL LABS











College Code : 70

ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES :: RAJAMPET (AUTONOMOUS)

Approved by AICTE, New Delhi. Affiliated to Jawaharlal Nehru Technological University Anantapur
B.Tech : CIVIL, MECH, EEE, ECE & CSE courses Accredited by NBA, New Delhi. Accredited by NAAC with A+ Grade
Recognized by UGC, New Delhi under sections 2(f) & 12(B) as per UGC act 1956. Institutional Member of ISTE

Dt: 10.10.2025

To,
The Program Manager,
Virtual Labs,
IIIT-Hyderabad.

Sir/Madam,

Sub: Virtual lab Workshops conducted in our college - Reg.

I thank you for organizing, workshop on VIRTUAL LABS at our College. The workshop was informative and encouraging. We received a very good response from the faculty and students who attended the workshop. We appreciate your effort and interest in motivating the participants to use Virtual Labs.

The total number of participants who attended the workshop conducted by Department of Civil Engineering on 09.10.2025 is 53. The usage recorded is 2030. The Photographs, Attendance Sheets and filled in Feedback Forms are being sent separately.

Thanking you,

Yours sincerely,

PRINCIPAL
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ANNAMACHARYA INSTITUTE OF
TECHNOLOGY & SCIENCES
NEW BOYANAPALLI-516 126
RAJAMPET, ANNAMAYYA Dist. A.P



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The total number of participants who attended the workshop conducted by Department of Civil Engineering on 23.09.2025 is 50. The usage recorded is 1794. The Photographs, Attendance Sheets and filled in Feedback Forms are being sent separately.

Thanking you,

Yours sincerely,

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The total number of participants who attended the workshop conducted by Department of Electronics and Communication Engineering on 15.09.2025 is 45. The usage recorded is 246. The Photographs, Attendance Sheets and filled in Feedback Forms are being sent separately.

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Yours sincerely,

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The total number of participants who attended the workshop conducted by Department of Electronics and Communication Engineering on 01.08.2025 is 93. The usage recorded is 611. The Photographs, Attendance Sheets and filled in Feedback Forms are being sent separately.

Thanking you,

Yours sincerely,

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