

Date: 23-12-2023

## Report on NITK Solve Virtual Lab Visit

Name of the Program:	Visit to NITK Solve Virtual Lab	Program Dates & Timings:	20-12-2023 9:00AM-1:00PM	
Name & Details of the Resource Person:	Prof. K.V. Gangadharan Ms. Shreshta, Senior Research Fellow Mrs. Vismaya, Senior Research Fellow Mr. Ruthvik, Junior Research Fellow Mr. Sumanth, Junior Research Fellow Mr. Ashutosh, Junior Research Fellow Mr. Poudhan, Junior Research Fellow Mr. Manish, Junior Research Fellow Mr. Neil, Junior Research Fellow			
Organized by (Clubs/ Dept.)	Virtual Lab Committee in association with department of ICB			
Number of Participants: 60	Stud ents:	58	Faculty:	02
Program Outcome (PO) Mapping	PO3, PO4, PO5, PO12			
Coordinator	Mr John Prakash Veigas			

### About the Program:

A hands-on awareness session was recently conducted at A J Institute of Engineering and Technology for first-semester Computer Science and Engineering students (IOT and Cyber security with Blockchain Technology). The session included a demonstration and insights into the advantages of virtual labs, highlighting the practical and educational benefits of the project. Initiated by the Ministry of Education in India, the Virtual Labs project revolutionizes ICT-based education by enabling remote experimentation.

**Objectives:** The program Virtual Lab awareness workshop enable students to

1. **Raise Awareness:** The Virtual Lab awareness workshop aims to inform students about the existence and benefits of Virtual Labs.
2. **Hands-on Experience:** Provide practical, hands-on experience to participants, allowing them to engage with various concepts covered in the Virtual Labs program.

3. **Inspire Learning:** Motivate students to explore both basic and advanced concepts by encouraging active participation in remote experimentation, fostering

### **About The Centre**

Centre for System Design (A Centre of Excellence at NITK Surathkal) envisages an interdisciplinary approach and means for realization of successful engineering systems. Key components for this are system modeling & simulation, understanding system dynamics, system optimization, virtual and physical experimentation. The Centre aims at facilitating and providing required environment for all the key components of system design. Modern engineering problems are comprised of elements from all the traditional disciplines and these elements must be integrated to meet the overall design objectives. The Centre focuses on how to address and solve problems that transcend traditional boundaries.

The following experiments are demonstrated in the lab:

#### **Remote Triggered Labs**

Remote Triggered Virtual Labs on Vibrations and Strength of Materials' are hosted by this Centre. These labs contain experiments on the said topics which can be controlled over the internet to perform and obtain experimental results which are typically done in physical labs of engineering colleges.

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#### **3D Printer**

The Centre has rapid prototyping facility using which 3D models (designed in CAD software) can be printed. The material used for such prototyping is ABS. For further details about 3D printing please use the web form on Contact page.

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#### **Data Acquisition Systems**

A variety of Data Acquisition Systems (C-DAQ, Compact-RIO, PXI) from National Instruments are available in this Centre which can cater to requirements such as large throughput, high sampling rate, FPGA etc. For specific details please use web form on Contact page.

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A computer aided three-dimensional interactive application design was made use of to create a base spring- female. A 3D System "Standard Triangle Language" or "Standard Tessellation Language" was used to convert to a corresponding G-code which basically is a language in which people tell computerized machine tools how to make something. A Slic3r is the tool one needs to convert a digital 3D model into printing instructions for a 3D printer. It cuts the model into horizontal slices (layers) and generates tool paths to fill them and then calculates the amount of material to be extruded. Fused deposition modeling (FDM) is an additive manufacturing (AM) technology commonly used for modeling, prototyping, and production applications. It is one of the

techniques used for 3D printing that involves fusion deposition method by expending polylactic acid filament. The finished prototypes are fitted under the seats of vehicles. The Inconel based material assembled gears rotate with passenger movements and power is hence, generated from the piezo materials.

**Outcomes:** On successful completion of program student should able to:

- Participants gain a heightened understanding of Virtual Labs, comprehending their purpose and advantages in educational settings.
- Students acquire hands-on experience, refining their practical skills in applying different concepts through the Virtual Lab workshop.
- The program cultivates a heightened interest among students, inspiring them to delve into basic and advanced concepts through remote experimentation, fostering a proactive approach to learning.

**Articulation Matrix:**

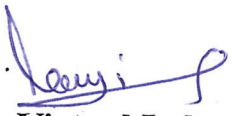
Course Outcomes	Program Outcomes											
	1	2	3	4	5	6	7	8	9	10	11	12
1					2							1
2			1		2							1
3				1	2							1
Average			1	1	2							1

**Photos:**





The Students from ICB 1st year trying the VI modules at NITK

  
**Virtual Lab**  
**Dept. Coordinator**

  
**Nodal Coordinator**

  
**Principal**  
**Principal**  
**A.J. Institute of Engineering & Technology**  
**Mangaluru - 575 006**