VEL TECH HIGH TECH

Dr. RANGARAJAN Dr. SAKUNTHALA ENGINEERING COLLEGE

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REPORT ON EVENT-1

THREE DAYS IDEATION WORKSHOP ON DESIGN THINKING AND ENGINEERING APPLICATIONS USING ARDUINO

(5.11.2025 - 7.11.2025)

VEL TECH HIGH TECH - AICTE-IDEA LAB

VEL TECH HIGH TECH

Dr. RANGARAJAN Dr. SAKUNTHALA ENGINEERING COLLEGE

#60,Avadi - Vel Tech Road, Vel Nagar,
Avadi, Chennai,
Tamil Nadu, India. Pincode:600062.

Prof. Dr. E. KAMALANABAN	Prof. Dr. V.R. RAVI	Prof. Dr. R. SURESH
AICTE IDEA LAB – CHIEF MENTOR	AICTE IDEA LAB – COORDINATOR	AICTE IDEA LAB – CO-COORDINATOR

Dr. S .SIVASARAVANA BABU	Dr. S. RAJAMANICKAM	Dr. G. MAHALAKSHMI	Mr. M. PARTHIBAN
Tech Guru	Tech Guru	Tech Guru	Tech Guru

EVENT APPROVAL

VEL TECH HIGH TECH
Dr.RANGARAJAN Dr. SAKUNTHALA ENGINEERING COLLEGE

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P. NO: 1048

AICTE-IDEA LAB

Proposal for Three days Workshop on Design Thinking and Engineering Applications using Arduino (AY2025-2026) Odd Semester

1	Name of the event	:	"Ideation Workshop on Design Thinking and Engineering Applications using Arduino "
2	Event scheduled date	:	5.11.2025 To 7.11.2025
3	Name of the resource person	:	Dr. V. R. Ravi
4	Details of the guest speaker	:	Dean Academics, VTHT
5	Resource person profile attached	:	Yes
6	Acceptance letter from the resource person	:	Yes
7	Faculty in-charge for the event	:	Dr.G.Mahalakshmi, Associate Professor/AI&DS HTS 1766, 9786704881 A/C: 75330100041587 BOB –VELTECH Branch, IFSC: BARB0VJVELT
8	No. of students	:	30 Students
9	Refreshment and Hospitality	:	35 Tea and Refreshment
10	Objective of the event	:	•To introduce participants to the Design Thinking process and its application in solving real-world engineering problems. •To provide hands-on experience with Arduino for developing innovative prototypes and practical engineering solutions.
11	Outcome of the event	:	•Participants will be able to apply Design Thinking principles to identify problems and develop innovative engineering solutions. •Participants will design and implement functional Arduino-based prototypes, demonstrating practical understanding of embedded systems and creative problem-solving.
12	Budget	:	Expenses Budget Certificate, Banner & Report — Rs.1800.00 Miscellaneous — Rs.1000.00 Total — Rs.2800.00
13	Website updation	:	— Sta
14	Photography & Video Required	:	Yes
15	Event No	:	VTHT- IDEA LAB/2025-26/01
16			AICTE Idea Lab Coordinator: 28.10.25 — AICTE Idea Lab Co- Coordinator: 28/10/2025
17	Approval from principal	:	28/10/2025

GIT / Events Organized
BUDGET ENTERED
Page No. VH - 1042
Signature

Supportive document–NBA–2.2 & 2.7

WORKSHOP BROCHURE

Vel Tech High Tech
Dr. Rangarajan Dr. Sakunthala Engineering College
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Ideation Workshop on Design Thinking and Engineering Applications using Arduino

November 05 - 07 , 2025

Venue : Saravanavel Auditorium

Organized by

VTHT-AICTE IDEA LAB

FOR REGISTRATION SCAN ME

Vel Tech High Tech
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01 | ABOUT INSTITUTION

Vel Tech High Tech Dr.RangarajanDr.Sakunthala Engineering College established in the year 2002 by Col. Prof. Dr. Vel. Shri. R.Rangarajan, Founder Chairman of R. S Trust is a minority institution. Vel Tech High Tech Dr.RangarajanDr.Sakunthala Engineering College was formerly known as Vel SRS Hitech Engineering College and was started with three departments to its credit viz. Electronics and Communication Engineering, Civil Engineering and Chemical Engineering with 52 students. The institution was approved by AICTE and was affiliated to Anna University in 2002.

02 | ABOUT WORKSHOP

The Ideation Workshop on Design Thinking and Engineering Applications using Arduino aims to foster creativity, problem-solving, and innovation among students by integrating Design Thinking methodology with Arduino-based prototyping.Participants will explore real-world engineering challenges and develop practical solutions through hands-on sessions.

03 | WORKSHOP HIGHLIGHTS

- Introduction to Design Thinking Framework
- Hands-on sessions with Arduino Uno and Sensors
- Development of mini engineering prototypes
- Team Ideation Challenge on real-world problems
- Guidance from AICTE IDEA Lab mentors

04 | WHO CAN PARTICIPATE

- UG and PG Students of Engineering and Technology
- Innovators and Enthusiasts passionate about IoT, Automation, and Smart Systems

05 | OBJECTIVES

- To introduce the fundamentals of Design Thinking for innovative engineering solutions.
- To enable students to ideate, prototype, and test their own concepts using Arduino.
- To bridge the gap between theory and practical implementation.
- To encourage interdisciplinary collaboration and creativity among students.

06 | KEY TOPICS COVERED

- Overview of Design Thinking Process
- Basics of Arduino Hardware and IDE
- Interfacing Sensors, Actuators, and Displays
- Rapid Prototyping Techniques
- Translating Ideas into Working Models

07 | Expected Outcomes

Participants will be able to:

- Understand and apply Design Thinking principles
- Develop functional prototypes using Arduino
- Build confidence in engineering innovation and teamwork
- Present creative project ideas for future incubation

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CHIEF PATRONS

Col. Prof. Vel. Shri. Dr. R. Rangarajan
Founder President & Chairman

Dr. Sakunthala Rangarajan
Foundress President & Vice Chairman

AICTE-IDEALAB CHIEF MENTOR

Prof. Dr. E. Kamalanaban
Principal

AICTE-IDEALAB COORDINATOR

Prof. Dr. V. R. Ravi Dean Academics

AICTE-IDEALAB CO-COORDINATOR

Prof. Dr. R. Suresh Dean SoMC

AICTE-IDEALAB TECH GURU'S

Dr. G. Mahalakshmi +91-97867 04881
Mr. M. Parthiban +91-96597 41118
vtht-idealab@velhightech.com

VTHT-AICTE IDEA LAB

08 | OBJECTIVE

The AICTE-IDEA Lab is dedicated to fostering a dynamic ecosystem that promotes innovation, nurtures creativity, and advances technological progress in both education and society. Recently, VTHT has been sanctioned with fund of ₹90 lakhs by AICTE, New Delhi, to establish this state-of-the-art facility. The primary objective of the IDEA Lab is to transform innovative ideas into functional prototypes, which can subsequently be developed into market-ready products through startup ventures.

09 | KEY FEATURES

- **Common Facility:**
  IDEA Lab is designed as common facility within our institute, accessible to all students, faculty, and nearby Industries.
- **24/7 Availability:**
  The IDEA lab is intended to be available 24/7 for students to use.
- **Equipped with Resources:**
  IDEA Lab provides a range of sophisticated equipment and tools, including 3D printers, 3D scanners, Drones, AR/VR equipments, Embedded Edge devices with varieties of sensors, AI Edge devices, IoT kits, CNC laser cutters, and computer workstations.
- **Industry Collaboration:**
  IDEA Lab collaborates with nearby industries to leverage their resources and expertise, fostering a symbiotic relationship between academia and industry.

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STATE-OF-THE-ART LABORATORIES

Internet of Things (IoT) Lab	Arduino Lab
Artificial Intelligence Lab	Advance Manufacturing Lab
Additive Manufacturing Lab	Design Thinking Lab
Reverse Engineering Lab	AR and VR Lab
Laser Technology Lab	Robotics Lab
PCB Design Lab	Drone Lab

STATE-OF-THE-ART EQUIPMENT

WIPRO 3D PRINTER

WEGSTR PCB MILLING MACHINE

LASER CUTTING MACHINE

Industrial 3D Scanner

DRONE

ROBOT

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Three days Ideation Workshop on Design Thinking and Engineering Applications using Arduino

PARTICIPANTS LIST

S.No	Student Name	VH Number	Dept.	Sem	Email ID	Mobile
1	DEEPAK R	14631	CSE	1	vh14631@velhightech.com	9943130502
2	CHAITHRA E K	14657	CSE	1	vh14657@velhightech.com	6383391983
3	VINOTH KUMAR V	14707	CSE	1	vh14707@velhightech.com	8925047274
4	HEMA DHEEKSHA S	14715	CSE	1	vh14715@velhightech.com	9345442351
5	VAISHNAVI R	14744	CSE	1	vh14744@velhightech.com	9751793622
6	ROHITH S	14801	AIDS	1	vh14801@velhightech.com	7904610834
7	KEVIN SUNDAR S	14835	AIDS	1	vh14835@velhightech.com	8189820116
8	NIVEDHA K	14836	AIDS	1	vh14836@velhightech.com	8807793627
9	SIVAPERUMAL C	14866	AIDS	1	vh14866@velhightech.com	7904125955
10	VIKASH R	14870	AIDS	1	vh14870@velhightech.com	9842782687
11	RISHIKA K	14872	AIDS	1	vh14872@velhightech.com	9342202344
12	BALAJI PILLAI K S	14876	AIDS	1	vh14876@velhightech.com	8825674041
13	SUDHAKAR D	14888	AIDS	1	vh14888@velhightech.com	6379834819
14	SONIYA R	14910	AIDS	1	vh14910@velhightech.com	9025208565
15	DARSHINI S	15177	AIML	1	vh15177@velhightech.com	6383292942
16	ESWARAJAY KALVAKOLLU	15189	AIML	1	vh15189@velhightech.com	9000447001
17	SHREYA R	15253	CIVIL	1	vh15253@velhightech.com	9884036501
18	SRIDHAR S	15328	ECE	1	vh15328@velhightech.com	8939346827
19	SRINITHI R P	15338	ECE	1	vh15338@velhightech.com	9080727865
20	SABARISH B	15365	ECE	1	vh15365@velhightech.com	9952007252
21	PRIDHARSHINI C	15370	ECE	1	vh15370@velhightech.com	8939496701
22	THITHIKSHA L	15488	CHEM	1	vh15488@velhightech.com	6302118508
23	DINESH KARTHICK A	15519	MECH	1	vh15519@velhightech.com	9710189748
24	MUTHULAKSHMI B	15539	MECH	1	vh15539@velhightech.com	6383015602
25	LAKSHMAN A	15583	CIVIL	1	vh15583@velhightech.com	9884374531
26	ADELINA S	15596	CIVIL	1	vh15596@velhightech.com	7604809173

3-Day Agenda: Ideation Workshop on Design Thinking and Engineering Applications using Arduino

DATE	TIME	AGENDA
05.11.25	08.15– 09.15	Registration & Welcome Address
	09.15 – 09.45	Inaugural Session & Workshop Overview
	09.45 – 11.15	Session 1: Introduction to Design Thinking – DT principles, Empathize–Define, problem framing
	11.15–11.30	Tea Break
	11.30– 12.30	Hands-on Activity: Arduino Basics – board overview
	12.30 – 01.15	Lunch Break
	01.15 – 02.00	Session 2: sensors& Actuators , IDE setup, Connecting Arduino with Arduino IDE
	02.00 – 03.30	Hands-on: Basic Arduino Programming – LED, button, buzzer
06.11.25	08.15–09.00	Recap & Team Discussion
	09.00–10.30	Session 3: Ideation Techniques – brainstorming, SCAMPER, mind maps
	10.30 – 10.45	Tea Break
	10.45 – 12.45	Hands-on: Sensor Interfacing – temperature, ultrasonic, IR
	12.45 – 01.15	Lunch Break
	01.15 – 02.45	Session 4: Actuator Interfacing – servo, motors, displays
	02.45 – 03.30	Team Activity: Concept Sketching & Block Diagram
07.11.25	08.15–09.00	Recap & Finalizing Prototype Idea
	09.00–10.30	Prototype Development – Part 1: wiring, coding logic
	10.30 – 10.45	Tea Break
	10.45 – 12.45	Prototype Development – Part 2: refinement & debugging
	12.45 – 01.15	Lunch Break
	01.15 – 02.45	Testing, Iterations & Demo Preparation
	02.45 – 03.30	Team Presentations & Prototype Demo
	03.30 – 04.00	Valedictory & Certificate Distribution

CHIEF GUEST PROFILE

Dr. V. R. Ravi is a distinguished academician and researcher with over **three decades of combined academic and industrial experience**. He earned his **Bachelor's Degree in Instrumentation and Control Engineering** from **Bharathiar University** in 1988, followed by a **Master's Degree in Applied Electronics** from the prestigious **PSG College of Technology** in 1995. He obtained his **Doctorate in Process Control** from **MIT CAMPUS-Anna University, Chennai**, in 2013.

With **28 years of teaching** and **8 years of industry experience**, Dr.V.R. Ravi currently serves as a **DEAN ACADEMICS** at **Vel Tech High Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Chennai**. His career reflects a deep commitment to academic excellence, research innovation, and industry–institute collaboration.

Dr.V. R. Ravi has successfully executed **Six Funded projects** worth of **Rs 1.25 Crores** sponsored by the **All India Council for Technical Education (AICTE)** and **seven industry-sponsored consultancy projects**, demonstrating his ability to translate academic research into industrial applications. In addition, he has completed **four innovative projects** worth of **Rs 8.0 Lakhs** funded by the **Department of Science and Technology (DST)** under the **Innovation and Entrepreneurship Development Centre (IEDC)** scheme.

He has made notable scholarly contributions with **11 research papers published in international journals** and **34 papers presented at international and national conferences**. His industrial exposure includes specialized training at reputed organizations such as **South India Viscose - Coimbatore**, **SPIC - Tuticorin**, **Seshasayee Paper & Boards Limited - Erode, Madras Refinery Limited – Chennai** and **National Instruments -Bangalore**.

Dr.V. R. Ravi's **areas of expertise** encompass **Process Control, Robotics and Automation, Embedded System Design, Soft Computing, Machine Learning, Internet of Things (IoT),** and **Image Processing**. His research interests focus on the integration of intelligent systems with real-time control and automation solutions.

He has been instrumental in organizing numerous **national-level workshops, seminars, short-term training programs (STTPs), and faculty development programs (FDPs)** sponsored by premier agencies such as **AICTE, DRDO, ICMR,** and **BRNS**. He has also delivered more than **24 invited lectures** at various engineering institutions across **Tamil Nadu, Karnataka,** and **Andhra Pradesh**, sharing his expertise with the academic community.

In addition to academic initiatives, Dr.V.R.Ravi has designed and conducted **value-added courses** and hands-on training programs in **Lab VIEW (Core I & II)**, **MATLAB programming**, **Arduino-based applications**, and **Raspberry Pi-based embedded systems**, fostering skill development among students and faculty.

His excellence has been recognized through several prestigious honors, including the **National Merit Scholarship** from the **Ministry of Education and Social Welfare, Government of India**, and the **First Prize in the State-Level Best Project Award** from the **Directorate of Technical Education (DOTE), Tamil Nadu**, in 1988. He was also conferred with a **Gold Medal** and inducted as a **Premier Member of the "India Lab VIEW Developer League"** by **National Instruments, Bangalore**, in 2010.

Dr. V. R Ravi's sustained contributions to bridging academia and industry earned him special appreciation from **DST–Texas Instruments** for fostering an ecosystem of **innovation, collaboration, and entrepreneurship** through the **India Innovation Challenge Design Contest (IICDC)** in 2018.

Three-Day Ideation Workshop on Design Thinking and Engineering Applications Using Arduino – DETAILED REPORT

This report presents a comprehensive and detailed account of the Three-Day Ideation Workshop on Design Thinking and Engineering Applications using Arduino, conducted from 05.11.2025 to 07.11.2025. The workshop was designed to provide participants with an immersive learning experience that integrates creativity, engineering principles, and hands-on prototype development. By combining Design Thinking methodologies with embedded systems training, the workshop empowered learners to convert conceptual ideas into functional engineering solutions. Throughout the three days, participants engaged in activities that strengthened their abilities to empathize with users, frame engineering problems, ideate effectively, and develop prototypes through systematic experimentation. The curriculum included expert-led lectures, interactive discussions, hardware interfacing sessions, team-based challenges, and guided prototype development exercises that emphasized problem-solving, innovation, and real-world applicability.

DAY 1: 05.11.2025 — Inauguration, Introduction to Design Thinking & Arduino Fundamentals

The first day of the workshop began with Registration followed by a warm Welcome Address delivered by our beloved Principal, Dr. E. Kamalanaban – Chief Mentor, AICTE IDEA Lab. He expressed his enthusiasm in seeing students participate in an interdisciplinary workshop that blends creativity with engineering application. The Principal highlighted the mission of the AICTE IDEA Lab in fostering innovation, design skills, and technical capability among young engineers. During his address, Dr. E. Kamalanaban emphasized the importance of cultivating a mind-set that is both inventive and user-centric. He encouraged participants to take full advantage of the workshop, reminding them that hands-on learning is a critical component in shaping future engineers. The Principal expressed confidence that the combination of Design Thinking and Arduino-based experimentation would help students develop projects that address real societal needs. The welcome speech set the tone for a productive and inspiring workshop ahead.

WELCOME ADDRESS BY PRINCIPAL (Short Text)

The Principal warmly welcomed all participants to this three-day Ideation Workshop on Design Thinking and Engineering Applications using Arduino. He expressed delight in witnessing enthusiastic young minds ready to explore creativity, technology, and problem-solving. The AICTE IDEA Lab, he explained, reflects the institution's strong commitment to innovation, experiential learning, and multidisciplinary collaboration.

Over the next few days, participants were told they would engage in hands-on activities, brainstorming exercises, and prototype development tasks that would help them translate ideas into meaningful engineering solutions. He encouraged participants to think boldly, collaborate effectively, and make optimal use of the resources and mentorship available throughout the workshop. The Principal concluded his address by wishing everyone an enriching and impactful learning experience.

SESSION 1: Introduction to Design Thinking

Following the inaugural session, the first technical session introduced Design Thinking (DT)—a human-centred problem-solving approach widely used in innovation-driven industries. The resource person explained the five stages of Design Thinking: Empathize, Define, Ideate, Prototype, and Test. Detailed examples were provided to illustrate how companies use DT to identify user needs, develop creative solutions, and test them efficiently. Participants discussed real-world engineering problems and

practiced defining them through empathy-based observation. They learned how problem framing shapes the entire innovation process, emphasizing that the clarity of the problem statement determines the value of the solution. Hands-on group exercises enabled students to explore scenarios where DT principles can be applied, encouraging critical thinking and collaborative exploration.

SESSION 2: Arduino Basics — Board Architecture and Programming Fundamentals

The next segment of Day 1 consisted of a practical, hands-on introduction to Arduino. Participants were introduced to the Arduino Uno microcontroller board, learning about its architecture, pin configuration, memory structure, and digital/analog functionalities. The facilitator demonstrated how the Arduino IDE is used for programming and uploading sketches to the microcontroller. Following lunch, the session shifted to interfacing fundamentals. Learners explored essential components such as LEDs, resistors, buzzers, and push buttons. They worked on basic programs including digital Write operations, delay functions, and input–output interaction logic. Through guided practice, students developed confidence in coding and hardware connection, setting the foundation for advanced interfacing on subsequent days.

DAY 2: 06.11.2025 — Ideation Techniques, Sensor Interfacing & Concept Development

Day 2 began with a recap of the previous day, followed by team-based discussions that

allowed participants to reflect on key learnings. This collaborative activity reinforced understanding and prepared teams for advanced sessions.

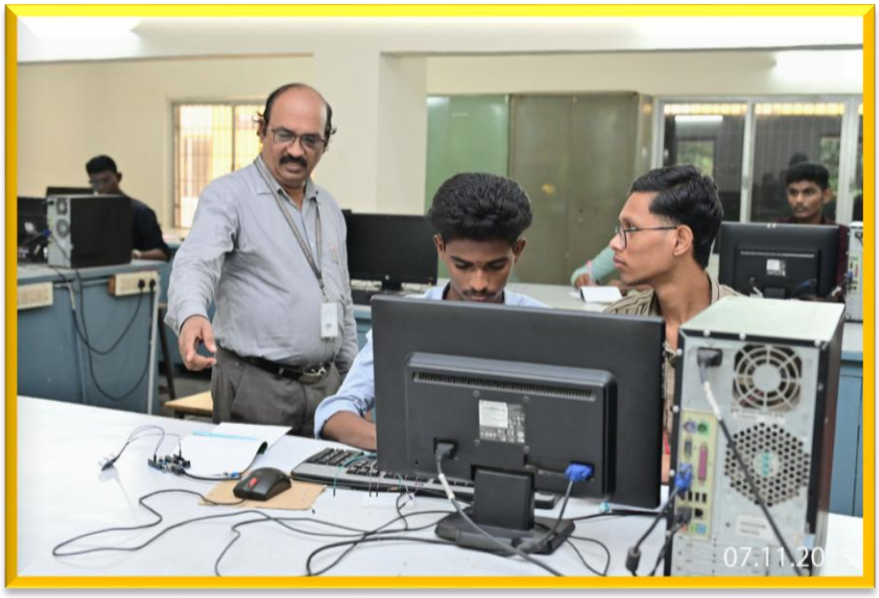
Session 3 introduced Ideation Techniques such as brainstorming, SCAMPER (Substitute, Combine, Adapt, Modify, Put to Another Use, Eliminate, Reverse), and Mind Mapping. The facilitator explained how these techniques stimulate creativity and help generate diverse solution pathways for a given problem. Teams practiced generating ideas using these tools, expanding their ability to think laterally and innovatively.

HANDS-ON SENSOR INTERFACING

A major highlight of Day 2 was the hands-on session on sensor interfacing. Participants learned to work with temperature sensors like LM35 and DHT11, ultrasonic distance sensors for proximity measurement, and IR sensors for object detection. They wrote Arduino programs to capture sensor data, process it, and display it using serial monitors. Students experimented with threshold detection logic, calibration, and environmental variations affecting sensor readings. This session reinforced practical coding skills while deepening understanding of embedded sensing systems. The interactive nature of the session enabled participants to immediately test and refine their code, fostering confidence and technical fluency.

SESSION 4: Actuator Interfacing & Concept Sketching

Post lunch, participants explored actuator control, learning to interface servo motors, DC motors, stepper motors, and electronic displays. They experimented with PWM (Pulse Width Modulation) signals to control motor speed and angle positions. Display modules such as 16x2 LCD screens and OLED displays were introduced, enabling teams to present real-time sensor outputs in a user-friendly format. The day ended with a concept sketching and blocks diagram activity, where teams transformed their ideas into structured technical representations. This exercise helped students plan the architecture of their prototypes, visualize wiring flow, and identify required components.



DAY 3: 07.11.2025 — Prototype Development, Testing & Demonstration

The final day began with a recap session where participants reviewed their progress and finalized their prototype ideas. Teams were guided through wiring, circuit integration, and coding logic development as part of Prototype Development Part 1. Facilitators offered support in debugging, correcting circuit faults, and refining logical errors. In Prototype Development Part 2, teams improved their initial builds, optimized performance, and prepared their models for demonstration. After lunch, teams worked on testing, iteration cycles, and final adjustments to ensure reliable function. The workshop concluded with Team Presentations and Prototype Demonstrations.

Each team explained their problem statement, design thinking process, hardware architecture, and final working model. The Valedictory Session and Certificate Distribution marked the successful completion of the workshop.

OVERALL SUMMARY

The three-day workshop effectively blended Design Thinking methodologies with hands-on engineering practice. Participants gained valuable skills in understanding user needs, framing problems, ideating systematically, and building functional prototypes using Arduino. The integration of sensors, actuators, and embedded programming provided participants with practical engineering capabilities. The workshop enhanced creativity, collaboration, and analytical thinking, resulting in innovative prototype demonstrations by the participants. The event was highly successful in encouraging students to pursue project-based learning and engineering innovation.

PARTICIPANTS ATTENDANCE DETAILS

VEL TECH HIGH TECH
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AICTE-IDEA LAB

Three days Ideation Workshop on Design Thinking and Engineering Applications using Arduino

Attendance Sheet

S.No	Student Name	VH Number	Branch	5.11.2025		6.11.2025		7.11.2025	
				FN	AN	FN	AN	FN	AN
1	DEEPAK R	14631	CSE						
2	CHAITHRA E K	14657	CSE						
3	VINOTH KUMAR V	14707	CSE						
4	HEMA DHEEKSHA S	14715	CSE						
5	VAISHNAVI R	14744	CSE						
6	ROHITH S	14801	AIDS						
7	KEVIN SUNDAR S	14835	AIDS						
8	NIVEDHA K	14836	AIDS						
9	SIVAPERUMAL C	14866	AIDS						
10	VIKASH R	14870	AIDS						
11	RISHIKA K	14872	AIDS						

PARTICIPANTS ATTENDANCE DETAILS

12	BALAJI PILLAI K S	14876	AIDS						
13	SUDHAKAR D	14888	AIDS						
14	SONIYA R	14910	AIDS						
15	DARSHINI S	15177	AIML						
16	ESWARAJAY KALVAKOLLU	15189	AIML						
17	SHREYA R	15253	CIVIL ECE						
18	SRIDHAR S	15328	ECE						
19	SRINITHI R P	15338	ECE						
20	SABARISH B	15365	ECE						
21	PRIDHARSHINI C	15370	ECE						
22	THITHIKSHA L	15488	CHEM						
23	DINESH KARTHICK A	15519	MECH						
24	MUTHULAKSHMI B	15539	MECH						
25	LAKSHMAN A	15583	CIVIL						
26	ADELINA S	15596	CIVIL			AB	AB	AB	AB

7.11.25

COORDINATOR

CO-CORDINATOR

CHIEF MENTOR

SAMPLE CERTIFICATES

Vel Tech High Tech
Dr. Rangarajan Dr. Sakunthala Engineering College
Approved by AICTE, New Delhi | Affiliated to Anna University, Chennai
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BEST APPRECIATION

VEL TECH HIGH TECH- AICTE IDEA LAB

CERTIFICATE OF APPRECIATION

This is to certify that Mr. .....BALAJI PILLAI K S.....
from...Vel Tech High Tech Dr. Rangarajan Dr. Sakunthala Engineering College....has participated in Ideation Workshop on Design Thinking and Engineering Applications using Arduino organized by VEL TECH HIGH TECH - AICTE IDEA LAB at Vel Tech High Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Avadi, Chennai, Tamil Nadu, India during 5th to 7th Nov 2025.

Prof. Dr. R. Suresh
AICTE-IDEA LAB CO-COORDINATOR

Prof. Dr. V. R. Ravi
AICTE-IDEA LAB COORDINATOR

Prof. Dr. E. Kamalajanban
AICTE-IDEA LAB CHIEF MENTOR

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BEST APPRECIATION

VEL TECH HIGH TECH- AICTE IDEA LAB

CERTIFICATE OF APPRECIATION

This is to certify that Ms. .....RISHIKA K.....
from...Vel Tech High Tech Dr. Rangarajan Dr. Sakunthala Engineering College....has participated in Ideation Workshop on Design Thinking and Engineering Applications using Arduino organized by VEL TECH HIGH TECH - AICTE IDEA LAB at Vel Tech High Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Avadi, Chennai, Tamil Nadu, India during 5th to 7th Nov 2025.

Prof. Dr. R. Suresh
AICTE-IDEA LAB CO-COORDINATOR

Prof. Dr. V. R. Ravi
AICTE-IDEA LAB COORDINATOR

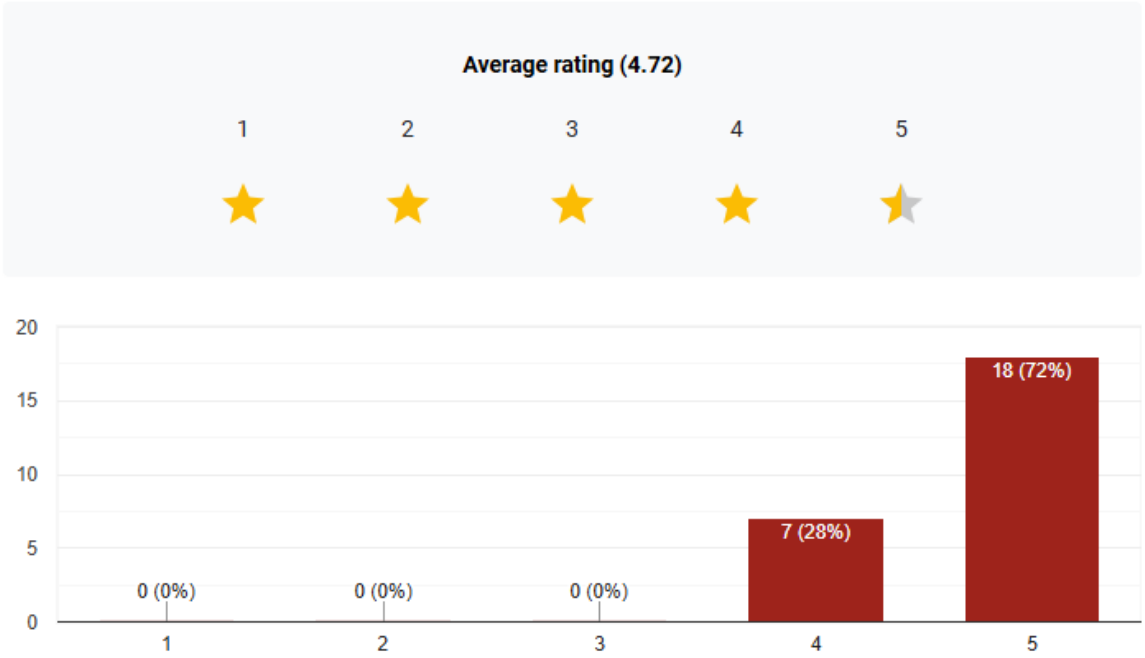
Prof. Dr. E. Kamalajanban
AICTE-IDEA LAB CHIEF MENTOR

PARTICIPANTS FEEDBACK

Clarity of workshop objectives and expected learning outcomes

Copy chart

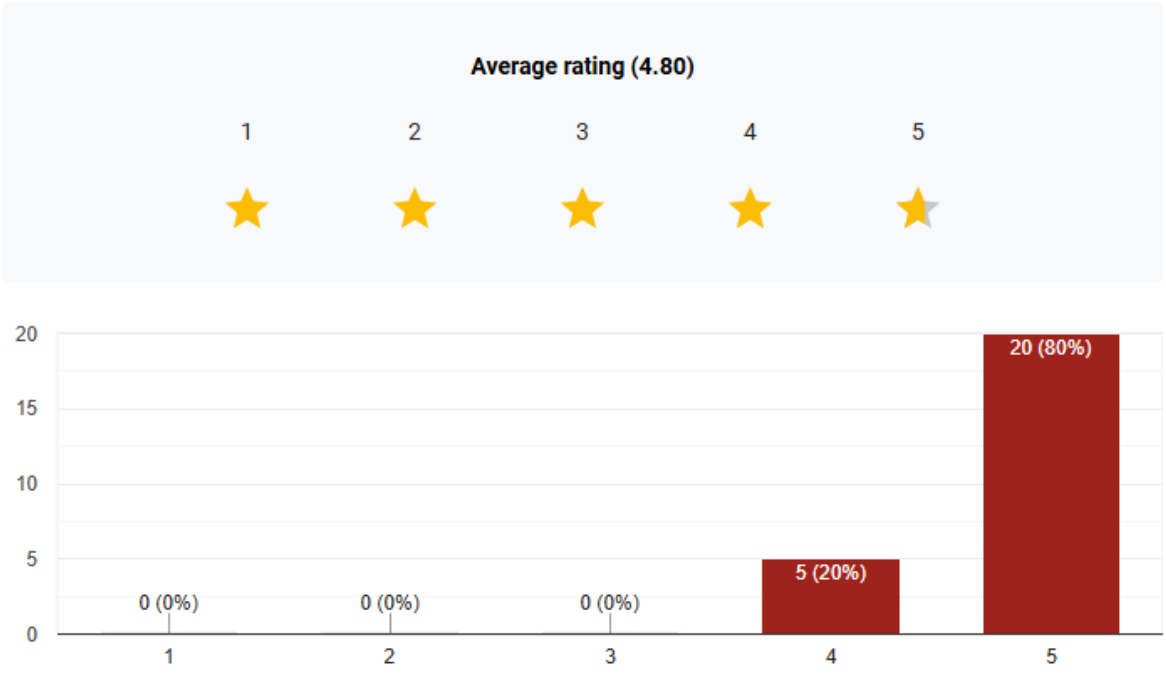
25 responses



How effectively did the workshop enhance your understanding of Design Thinking, Arduino applications, and problem-solving skills

Copy chart

25 responses

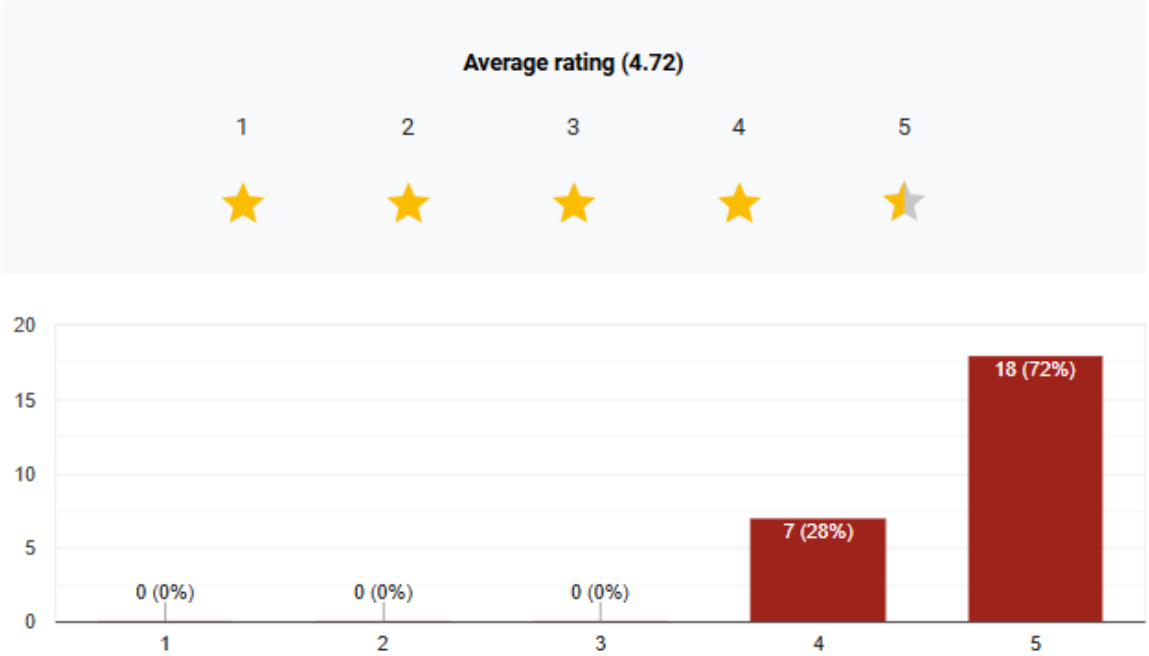


PARTICIPANTS FEEDBACK

This workshop covered the objectives well

Copy chart

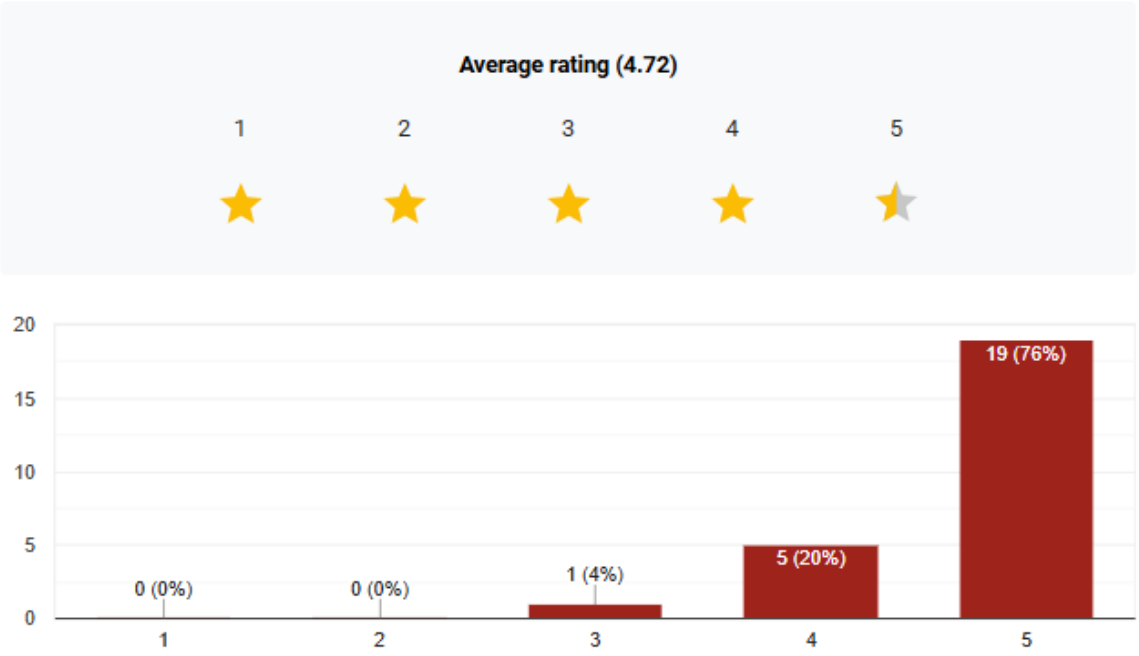
25 responses



Balance between theoretical concepts and practical applications

Copy chart

25 responses

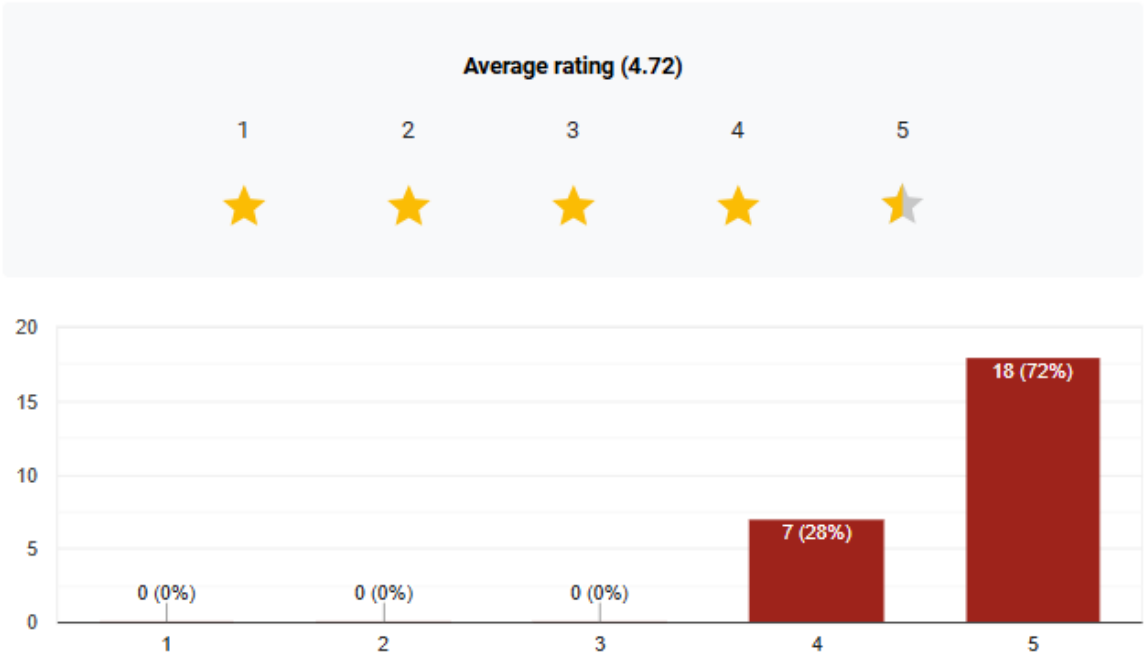


PARTICIPANTS FEEDBACK

Copy chart

Understanding gained on Design Thinking methodology

25 responses



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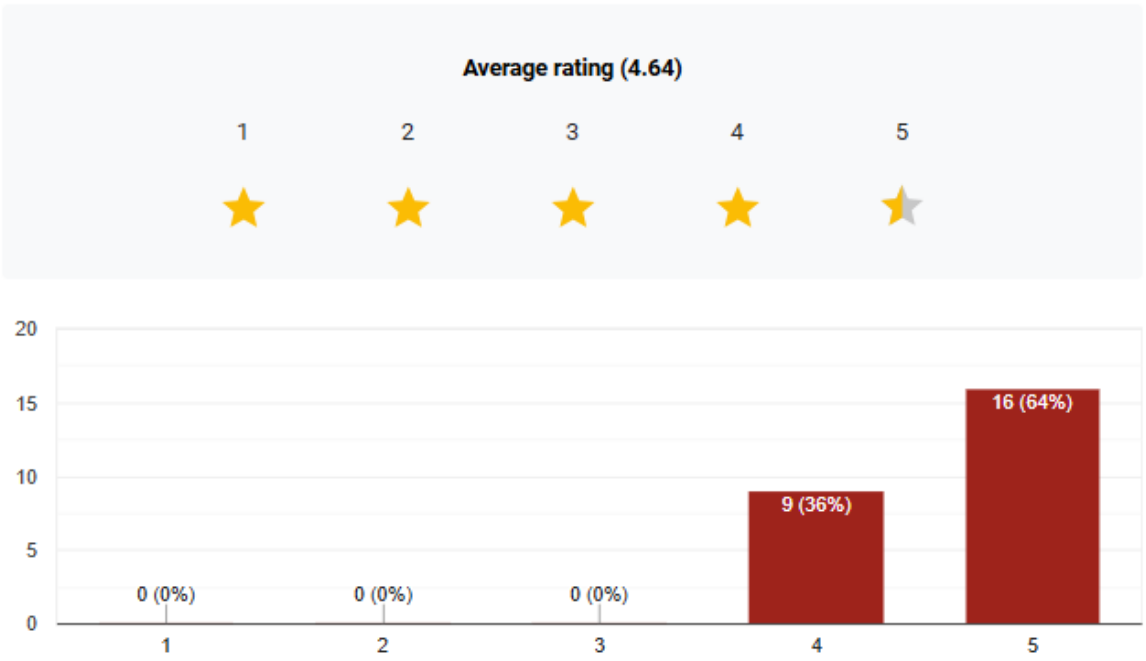
Applicability of Arduino-based experiments to real-world engineering problems.

25 responses



PARTICIPANTS FEEDBACK

Use of innovative teaching aids (Arduino kits, simulations, hands-on activities).

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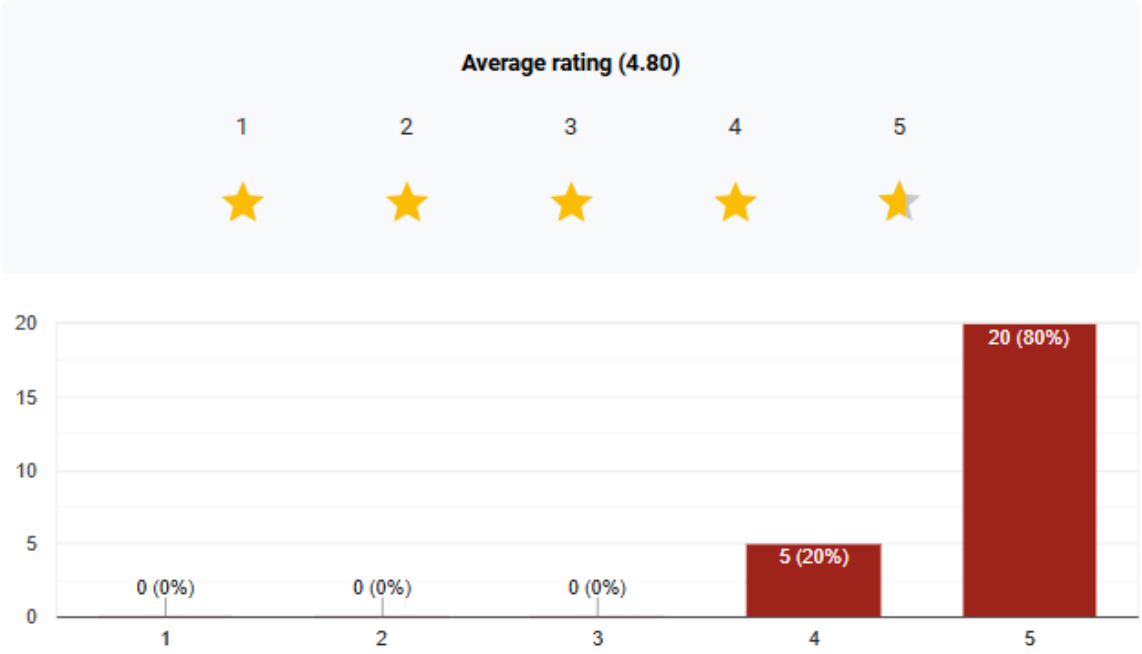
25 responses



Engagement and interaction during sessions

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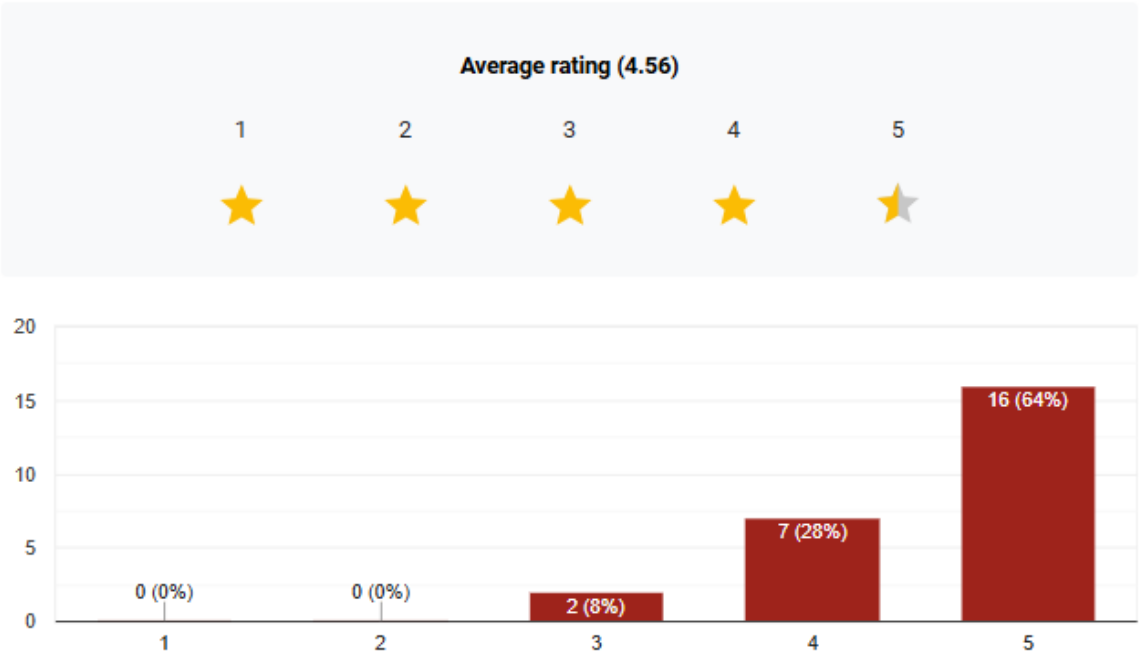
25 responses



PARTICIPANTS FEEDBACK

Exposure to innovation process from ideation to prototype

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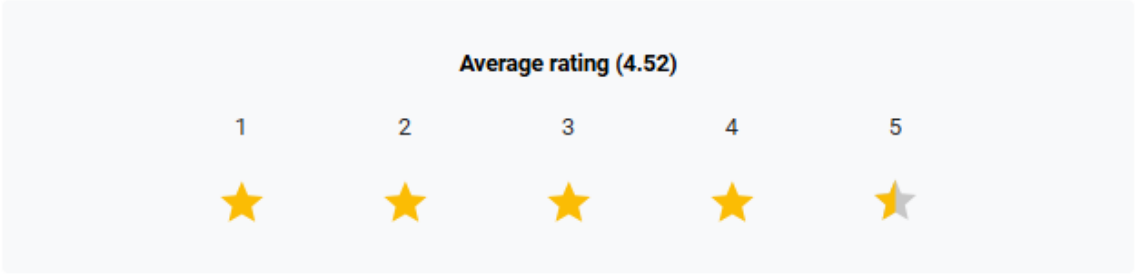
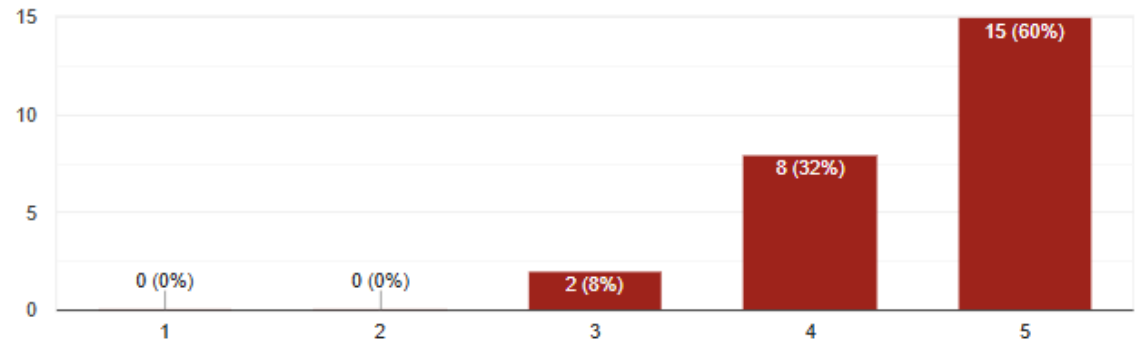
25 responses

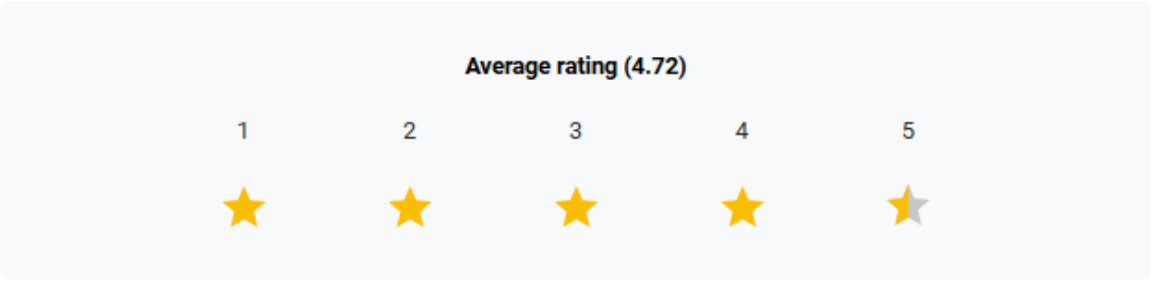


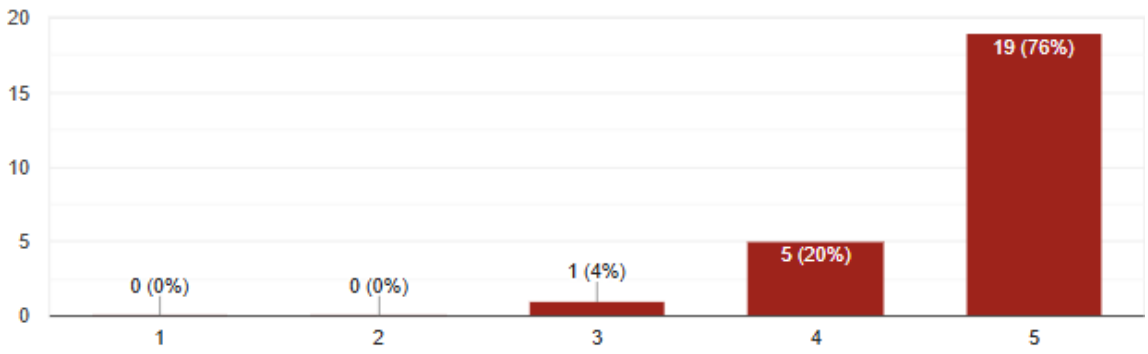


Copy chart

Overall usefulness of the workshop in enhancing technical and design skills.

25 responses





PARTICIPANTS FEEDBACK

Suggestions for improvement and additional topics of interest.

25 responses

Nothing
It's well and good
Computers in the lab can be improved.The workshop was really informative and useful.
It give more information about technical feasibility and I expect I type of lab workshop should me taken in other field like matlab etc.
I'm interested in robotics
It was a great experience to gain knowledge from the experience faculty and learn about new things
Session can be extended even more days.
We need more experiments in these three days .we have learnt more than i expected

PHOTO GALLERY

PHOTO GALLERY

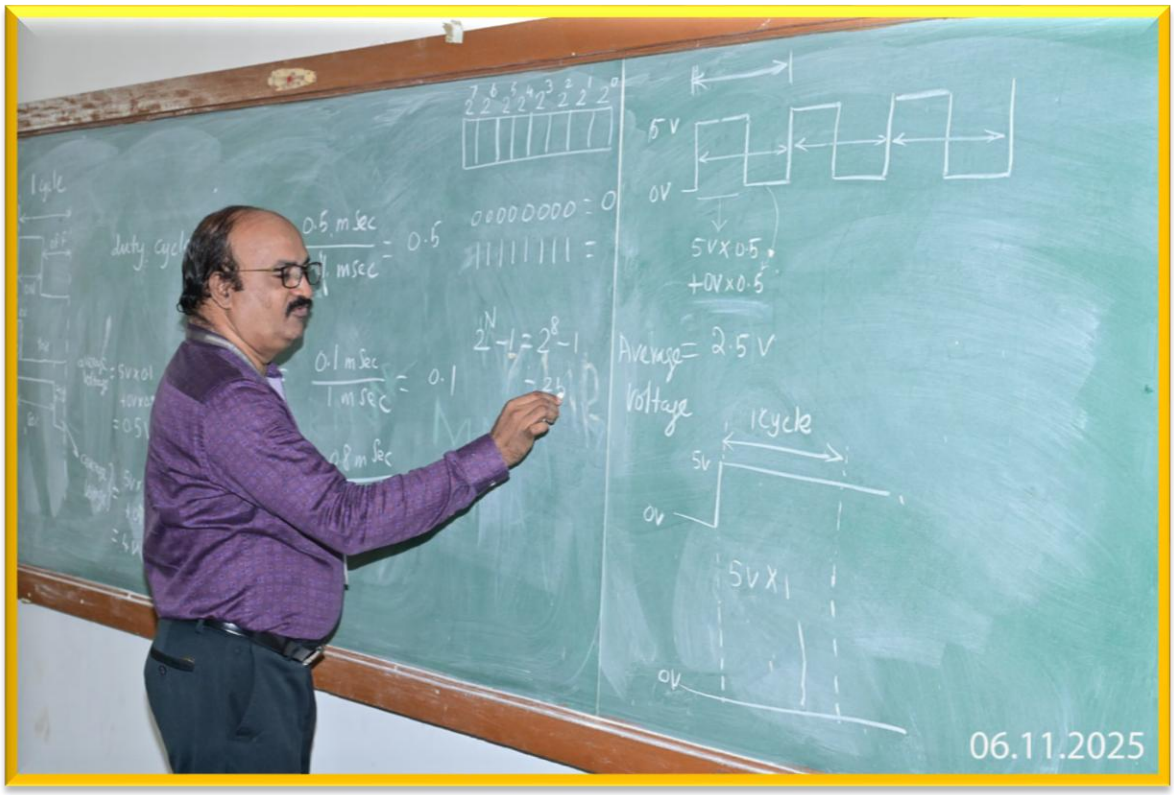


PHOTO GALLERY

STUDENT PROJECT

Automatic Plant Watering System Using Arduino

PROJECT DESCRIPTION:

An **Automated Plant Watering System using Arduino** uses a soil moisture sensor to detect dry soil, triggering an Arduino to activate a water pump via a relay, delivering water until the soil reaches optimal moisture, preventing overwatering and manual effort.

CORE COMPONENTS:

- **Arduino Uno:** The brain, processing sensor data and controlling outputs.
- **Soil Moisture Sensor (Capacitive/Resistive):** Measures soil wetness; higher resistance usually means drier soil.
- **Relay Module:** Acts as a switch, allowing the low-power Arduino to control the higher-power water pump.
- **Water Pump (12V):** Submersible pump to draw water from a reservoir.
- **Water Reservoir & Tubing:** Holds water and directs it to the plant.
- **Jumper Wires & Breadboard:** For connections.
- **Power Supply:** For the Arduino and pump.
- **(Optional) LCD Display:** Shows moisture level and pump status.

HOW IT WORKS:

1. **Sensing:** The moisture sensor is placed in the soil, sending analog readings to the Arduino.
2. **Logic:** The Arduino reads the sensor (e.g., maps 0-1023 values to 0-100% moisture) and checks if it's below a set `threshold` (e.g., 30%).
3. **Actuation:** If dry, Arduino sends a signal to the relay's `IN` pin (e.g., to digital pin 3).
4. **Pumping:** The relay closes the circuit, turning on the water pump.
5. **Stopping:** The pump runs until the sensor reads sufficient moisture, then the Arduino deactivates the relay, stopping the pump.

CONNECTION DIAGRAM

Soil Moisture Sensor

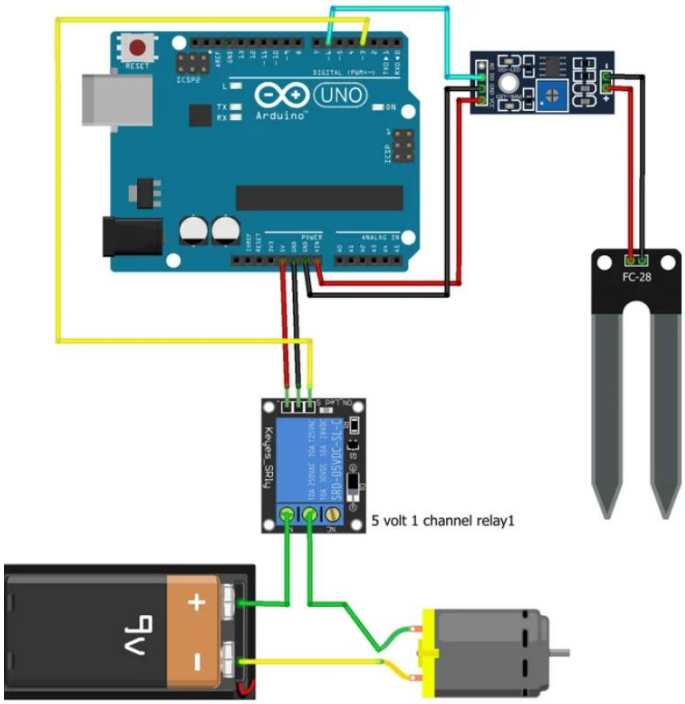
- VCC of the soil moisture sensor connects to the 5V pin on the Arduino.
- GND of the soil moisture sensor connects to the GND pin on the Arduino.
- DO (Digital Output) of the soil moisture sensor connects to D6 on the Arduino.

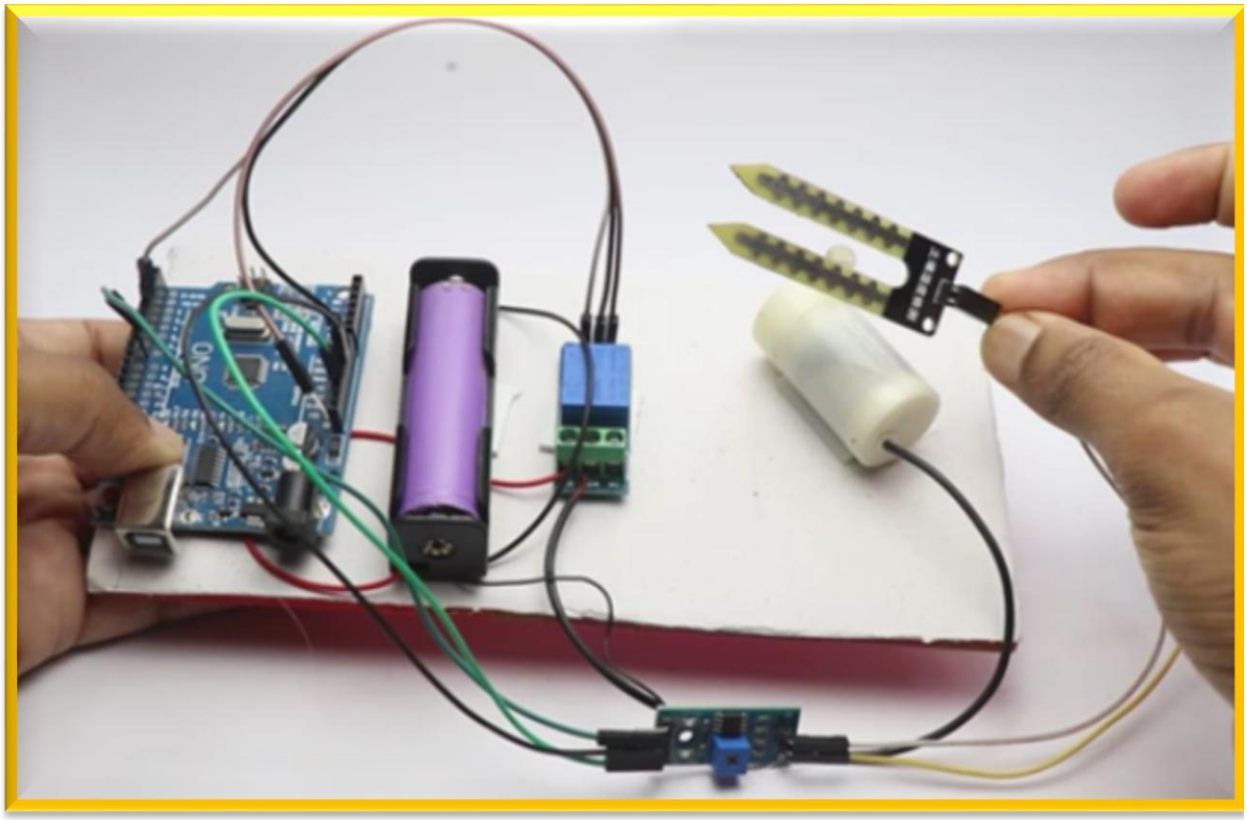
Relay Module

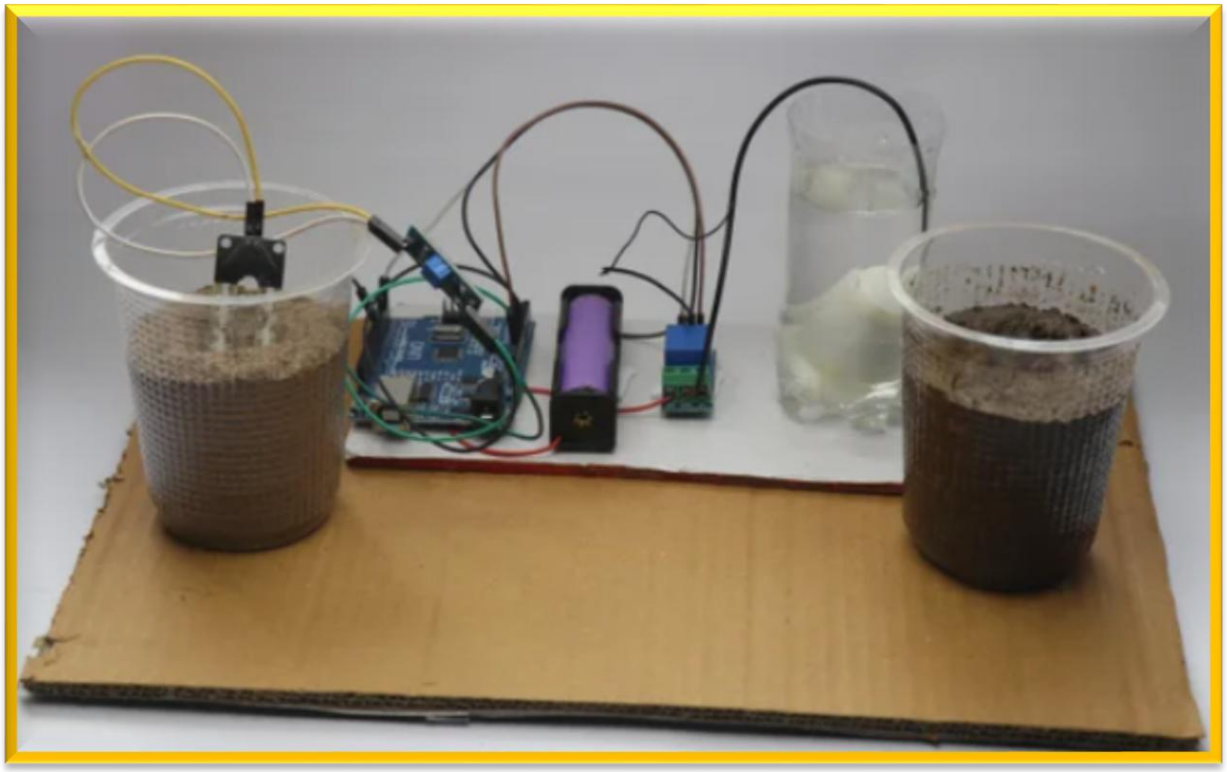
- VCC of the relay module connects to the 5V pin on the Arduino.
- GND of the relay module connects to the GND pin on the Arduino.
- Signal Pin (S) of the relay module connects to D3 on the Arduino.

Submersible Pump

- Connect one terminal of the submersible pump to the normally open (NO) terminal of the relay.
- Connect the other terminal of the submersible pump to the positive terminal of the power supply for the pump.
- Connect the common (COM) terminal of the relay to the **negative terminal** of the power supply.







WORKING OF THE PROJECT

To test this project, we have to dip the moisture sensor to the soil where the plant is growing and turn on the system. When the moisture sensor starts to detect low levels of water it triggers the Arduino board to activate the pump.The pump then turns on and keep circulating water for few seconds and then when the enough moisture level is achieved the pump turns of automatically.

PROGRAM

```
int water; //random variable
voidsetup(){
  pinMode(3,OUTPUT); //output pin for relay board, this will sent signal to the relay
  pinMode(6,INPUT); //input pin coming from soil sensor
}


voidloop(){
  water = digitalRead(6);  // reading the coming signal from the soil sensor
  if(water == HIGH) // if water level is full then cut the relay
  {
  digitalWrite(3,LOW); // low is to cut the relay
  }
  else
  {
  digitalWrite(3,HIGH); //high to continue proving signal and water supply
  }
  delay(400);
}
```

Conclusion

The Automatic Plant Watering System using Arduino successfully demonstrates an efficient and reliable method of maintaining optimal soil moisture levels without continuous human intervention. By using a soil moisture sensor and an automated water pump, the system ensures that plants receive the right amount of water at the right time, reducing water wastage and improving plant health. This project proves to be cost-effective, energy-efficient, and highly suitable for home gardens, nurseries, and small-scale agricultural applications. With further enhancements such as IoT integration, mobile app monitoring, and solar power support, the system can be expanded into a smart irrigation solution for larger farming needs.

EXPENSE STATEMENT

S.NO	ITEM DESCRIPTION	DATE	BILL NO	AMOUNT (Rs)
1	Banner	03.11.2025	19290	500
2	Brochure	04.11.2025	54446	75
3	Certificate	07.11.2025	580	306
4	Students Kit	05.11.2025	58599	1166
5	Miscellaneous (Battery, colour Xerox)	07.11.2025	-	142
6	Report	10.12.2025		
	Total			2189

Prof. Dr. R. SURESH
AICTE IDEA LAB – CO-COORDINATOR

Prof. Dr. V.R. RAVI
AICTE IDEA LAB – COORDINATOR

Prof. Dr. E. KAMALANABAN
AICTE IDEA LAB – CHIEF MENTOR

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Bill No. 19290

T.SARAVANAKUMAR BE
9952797980
044-26557980

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CASH BILL / DC

To. Vel Tech High Tech AICTE LAB Date. 03/11/25

S.NO	DESCRIPTION	QTY	RATE/UNIT	AMOUNT
1	6x4 Banner	2	250	500
			TOTAL	500

ADVANCE CASH

Advance........................

Thank you

SLK DIGITAL

Cash mode: ☐ cash ☐ check ☐ card ☐ credit ☑ account transfer

MEMO

Sky XEROX

#13, Rani Nagar, Alamathi Road, Tiruvallur, Chennai - 600062
skyxeroxchennai@gmail.com 7339221595 6380477074

XEROX, PRINTS, BINDING, LAMINATION, STATIONARIES

Bill No. Date 04/11/25
Mr./Ms. Veltech

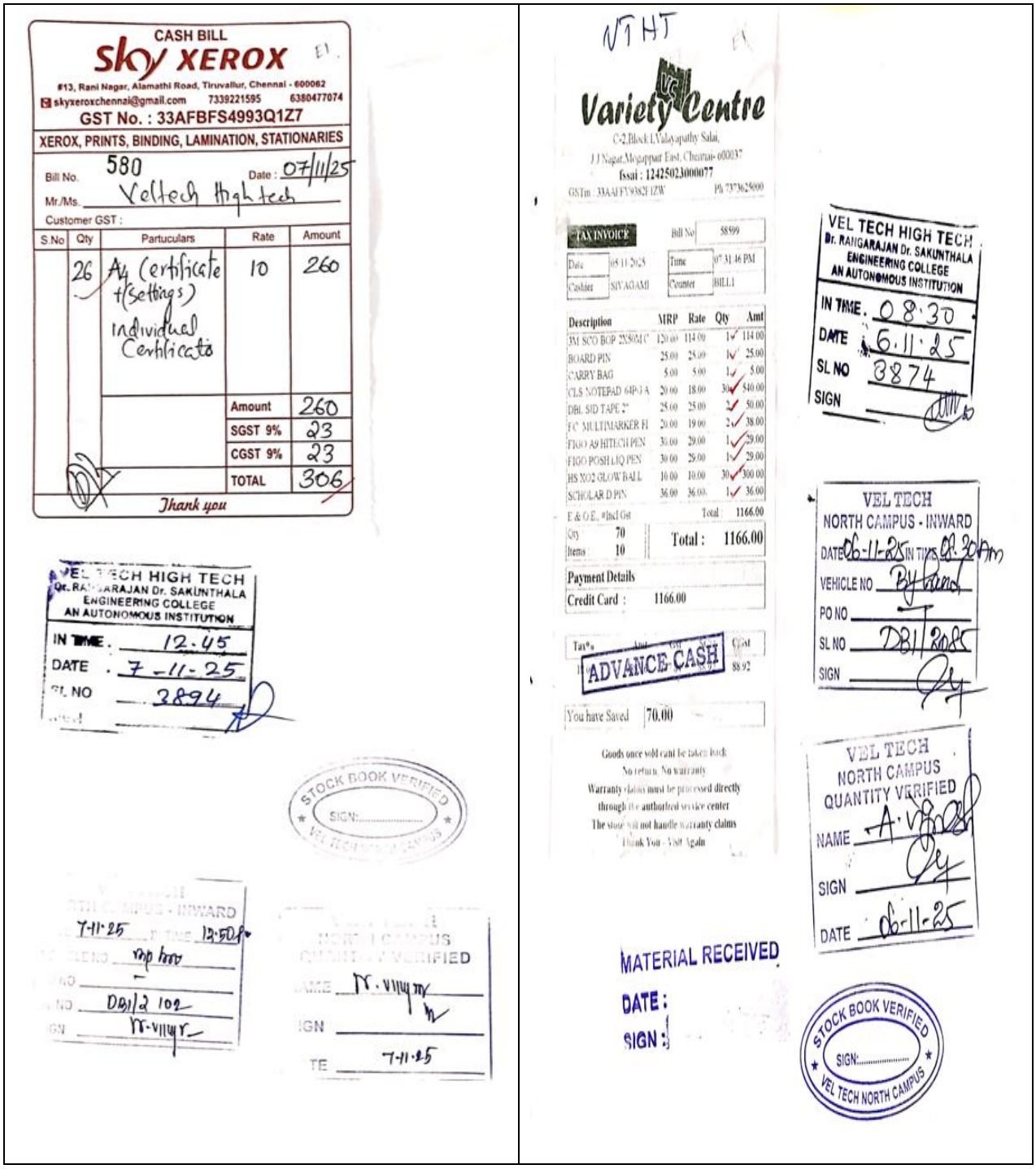
S.No	Qty	Particulars	Amount
	3	A4 Brochure	75
		TOTAL	75

Thank you

VEL TECH HIGH TECH
Dr. RANGARAJAN Dr. SAKUNTHALA
ENGINEERING COLLEGE
AN AUTONOMOUS INSTITUTION

IN TIME . 16.20
DATE . 4-11-25
SL NO 3864
SIGN

BILL COPY



CASH BILL

Sky XEROX

#13, Rani Nagar, Alamathi Road, Tiruvallur, Chennai - 600062
skyxeroxchennai@gmail.com 7339221595 6380477074

GST No. : 33AFBFS4993Q1Z7

XEROX, PRINTS, BINDING, LAMINATION, STATIONARIES

Bill No. 580 Date : 07/11/25

Mr./Ms. Veltech thgh tech

Customer GST :

S.No	Qty	Particulars	Rate	Amount
	26	A4 (certificate t/settings) individual Certificate	10	260
			Amount	260
			SGST 9%	23
			CGST 9%	23
			TOTAL	306

Thank you

VEL TECH HIGH TECH
Dr. RANGARAJAN Dr. SAKUNTHALA
ENGINEERING COLLEGE
AN AUTONOMOUS INSTITUTION
IN TIME. 12.45
DATE 7-11-25
SL NO 3894

STOCK BOOK VERIFIED
SIGN:
VEL TECH NORTH CAMPUS

7-11-25 TIME 12.50
SIGN
DATE 7-11-25

VIHT

Variety Centre

C-2,Block I,Valayapathy Salai,
J J Nagar,Mogappair East, Chennai- 600037
fssai : 12425023000077
GSTin : 33AAFFV9382F1ZW Ph 73736 25000

TAX INVOICE Bill No 58599

Date 05/11/2025 Time 07:31:46 PM
Cashier SIVAGAMI Counter BILL1

Description	MRP	Rate	Qty	Amt
3M SCO BOP 2X50M C	120.00	114.00	1	114.00
BOARD PIN	25.00	25.00	1	25.00
CARRY BAG	5.00	5.00	1	5.00
CLS NOTEPAD 64P-I A	20.00	18.00	30	540.00
DBL SID TAPE 2"	25.00	25.00	2	50.00
FC MULTIMARKER FI	20.00	19.00	2	38.00
FIGO A9 HITECH PEN	30.00	29.00	1	29.00
FIGO POSH LIQ PEN	30.00	29.00	1	29.00
HS X02 GLOW BALL	10.00	10.00	30	300.00
SCHOLAR D PIN	36.00	36.00	1	36.00

E & O.E., #Incl Gst Total 1166.00

Qty 70 Items 10 Total : 1166.00

Payment Details
Credit Card : 1166.00

Tax% Amt Cost
ADVANCE CASH 88.92

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Goods once sold cant be taken back
No return, No warranty
Warranty claims must be processed directly through the authorized service center
The store will not handle warranty claims
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DATE 6.11.25
SL NO 3874
SIGN

VEL TECH
NORTH CAMPUS - INWARD
DATE 06-11-25 IN TIME 08.20AM
VEHICLE NO By Hand
PO NO
SL NO DBI/2085
SIGN

VEL TECH
NORTH CAMPUS
QUANTITY VERIFIED
NAME A. Vignesh
SIGN
DATE 06-11-25

STOCK BOOK VERIFIED
SIGN:
VEL TECH NORTH CAMPUS

BILL COPY

CASH VOUCHER

Institution : Veltech High Tech Vr.No. : 64403 / year : 2025

Name : Dr.S. Rajamanickam Date : 03.11.2025

Event - I Expenses PARTICULARS	Rs.	P.
A4 Colour Xerox	70	00
AAA Battery (4 No's)	72	00
	142	00

03.11.25

Received with thanks Rupees One hundred and fourty two

03/11/2025

Passed by Receiver's Signature :