



# VEL TECH HIGH TECH

Dr. RANGARAJAN Dr. SAKUNTHALA ENGINEERING COLLEGE

An Autonomous Institution

Approved by AICTE, New Delhi | Affiliated to Anna University,  
Chennai



## REPORT ON EVENT-7

**Three days Ideation Workshop on Rapid Prototyping through  
design thinking with Arduino**  
(22.12.2025 - 24.12.2025)



**VEL TECH HIGH TECH - AICTE-IDEA LAB**

## VEL TECH HIGH TECH

Dr. RANGARAJAN Dr. SAKUNTHALA ENGINEERING COLLEGE

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AICTE IDEA LAB – CHIEF MENTOR

**Prof. Dr. V.R. RAVI**

AICTE IDEA LAB – COORDINATOR

**Prof. Dr. R. SURESH**

AICTE IDEA LAB – CO-COORDINATOR

**Dr. S.SIVASARAVANA BABU**

Tech Guru

**Dr. S. RAJAMANICKAM**

Tech Guru

**Dr. G. MAHALAKSHMI**

Tech Guru

**Mr. M. PARTHIBAN**

Tech Guru

# EVENT APPROVAL



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

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AICTE IDEA LAB







### Proposal for Three days Ideation Workshop on Rapid Prototyping through Design Thinking with Arduino

(AY2025-2026) Even Semester

1	Name of the event	:	Three days Ideation Workshop on Rapid Prototyping through Design Thinking with Arduino						
2	Event scheduled date	:	22.12.2025 To 24.12.2025						
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	Venue	:	Computer Lab						
7	Faculty in-charge for the event	:	Dr.G.Mahalakshmi, Associate Professor/AI&DS HTS 1766, 9786704881 A/C: 75330100041587 BOB -VELTECH Branch, IFSC: BARBOVJVELT						
8	No. of Students	:	30						
9	Refreshment and Hospitality	:	35 Tea and Refreshment						
10	Objective of the event	:	<ul style="list-style-type: none"> <li>Introduce the fundamentals of Design Thinking and Innovation Methodology</li> <li>Provide hands-on experience in rapid prototyping using Arduino.</li> </ul>						
11	Outcome of the event	:	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>Design and develop basic Arduino-based prototypes</li> <li>Develop an innovation mind-set and readiness for product development and start-ups.</li> </ul>						
12	Budget	:	<table border="1"> <thead> <tr> <th colspan="2">Expenses Budget</th> </tr> </thead> <tbody> <tr> <td>Certificate, Banner &amp; Report</td> <td>Rs.1500.00</td> </tr> <tr> <td>Total</td> <td>Rs.1500.00</td> </tr> </tbody> </table>	Expenses Budget		Certificate, Banner & Report	Rs.1500.00	Total	Rs.1500.00
Expenses Budget									
Certificate, Banner & Report	Rs.1500.00								
Total	Rs.1500.00								
13	Website updation	:	?						
14	Photography & Video Required	:	Yes						
15	Event No	:	VTHT IDEA LAB /2025-26/07						
16	Approval from principal	:	<table border="1"> <tr> <td>   AICTE Idea Lab Co- Coordinator </td> <td>   AICTE Idea Lab Coordinator </td> </tr> </table>	 AICTE Idea Lab Co- Coordinator	 AICTE Idea Lab Coordinator				
 AICTE Idea Lab Co- Coordinator	 AICTE Idea Lab Coordinator								
 Principal									

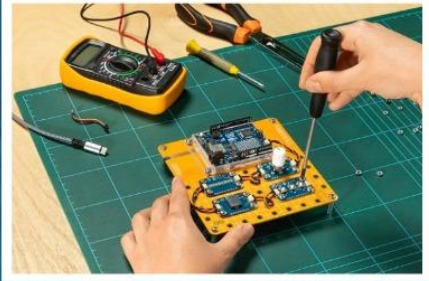


# WORKSHOP BROCHURE

**Vel Tech High Tech**  
Dr. Rangarajan Dr. Sakunthala Engineering College  
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An Autonomous Institution

## Three days Ideation Workshop on Rapid Prototyping through Design Thinking with Arduino




**December 22<sup>nd</sup> - 24<sup>th</sup>, 2025**  
**Venue : IOT Lab**

**Organized by**  
**VEL TECH HIGH TECH**  
**AICTE IDEA LAB**

**P.No: 07**

**FOR REGISTRATION SCAN ME**








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### ABOUT INSTITUTION

Vel Tech High Tech Dr. Rangarajan Dr. Sakunthala Engineering College (An Autonomous Institution) was established in 2002 by Col. Prof. Vel. Dr. R. Rangarajan and Dr. Sagunthala Rangarajan, who have been devoted to the field of education for over three decades. The institution is approved by AICTE, New Delhi, and affiliated with Anna University, Chennai, Tamil Nadu. The college has been accredited with an 'A' Grade and a CGPA of 3.27 by NAAC and by NBA for its Biotechnology, Chemical, ECE, and IT programs. The college boasts state-of-the-art infrastructure that provides students with practical, hands-on learning experiences, enabling them to develop essential employability skills and secure placements in top MNCs. The institution has been sanctioned an AICTE IDEA Lab with a grant of ₹90 lakhs under the AICTE's national initiative to promote Innovation, Design Thinking, and Entrepreneurship among students and faculty members. Vel Tech High Tech offers nine undergraduate programs (B.E./B.Tech) — AIDS, CSE (AIML), CSE, ECE, IT, Chemical, Biotechnology, Mechanical, and Civil Engineering — along with postgraduate programs in M.E. Structural Engineering and MBA.

### ABOUT WORKSHOP

The Three Days Ideation Workshop on Rapid Prototyping through Design Thinking with Arduino is designed to provide participants with hands-on experience in transforming innovative ideas into functional prototypes. The workshop integrates the principles of Design Thinking with practical Arduino-based prototyping, enabling participants to identify real-world problems, develop creative solutions, and build working models. Through interactive sessions, team-based activities, and guided mentorship, the workshop fosters innovation, critical thinking, and technical skills essential for modern engineering and product development.

### WORKSHOP HIGHLIGHTS

- Expert-led interactive sessions
- Hands-on Arduino programming and hardware interfacing
- Real-time problem identification and solution development
- Team-based mini project and prototype development
- Live demonstrations and case studies
- Mentorship and technical guidance from industry/academic experts
- Prototype and idea pitching sessions

### WORKSHOP OBJECTIVES

The key objectives of the workshop are to:

- Introduce the fundamentals of Design Thinking and Innovation Methodology
- Develop problem-solving and creative thinking skills among participants
- Provide hands-on experience in rapid prototyping using Arduino
- Enable participants to convert ideas into working prototypes
- Promote teamwork, collaboration, and entrepreneurial thinking





### KEY TOPICS COVERED

- Introduction to ML, DL & TensorFlow ecosystem
- Data preprocessing and feature engineering
- Artificial Neural Networks (ANN) basics
- Convolutional Neural Networks (CNN) for image processing
- Recurrent Neural Networks (RNN) & LSTM for sequence modelling
- TensorFlow Model Deployment basics (TFLite, web-edge deployment)
- Case studies and real-world engineering applications
- Model optimization, tuning & evaluation techniques

### Expected Outcomes

Participants will be able to:

- Apply Design Thinking principles to solve real-world problems
- Design and develop basic Arduino-based prototypes
- Interface sensors and actuators effectively
- Write and debug Arduino programs confidently
- Work effectively in teams and present innovative solutions
- Develop an innovation mind-set and readiness for product development and start-ups

**Vel Tech High Tech**  
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### CHIEF PATRONS

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

**Dr. Sakunthala Rangarajan**  
Foundress President & Vice Chairman

### 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

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## VEL TECH HIGH TECH -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

<b>WIPRO 3D PRINTER</b> 	<b>WEGSTR PCB MILLING MACHINE</b> 
<b>LASER CUTTING MACHINE</b> 	<b>Industrial 3D Scanner</b> 
<b>DRONE</b> 	<b>ROBOT</b> 



# VEL TECH HIGH TECH

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Chennai



## Three days Ideation Workshop on Rapid Prototyping through design thinking with Arduino

### PARTICIPANTS LIST

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# **Three days Ideation Workshop on Rapid Prototyping through design thinking with Arduino**

## **AGENDA**

### **Day 1 (22.12.2025): Design Thinking & Problem Ideation**

#### **Objective:**

Introduce participants to Design Thinking methodology and enable them to identify real-world problems suitable for Arduino-based rapid prototyping.

#### **Concepts & Topics:**

- Introduction to Design Thinking and its relevance in engineering innovation
- Design Thinking stages: Empathize, Define, Ideate, Prototype, Test
- Identifying societal, industrial, and campus-based problem statements
- User-centric problem analysis and need identification
- Converting real-world problems into engineering design challenges
- Basics of rapid prototyping and product development lifecycle
- Overview of Arduino ecosystem and its role in prototyping

#### **Hands-on Activities:**

- Empathy mapping and stakeholder analysis
- Brainstorming techniques: SCAMPER, Mind Mapping, Crazy-8
- Problem statement formulation using “How Might We” (HMW) framework
- Team formation and idea pitching
- Selection of problem statements for prototyping

#### **Tools & Resources:**

- Design Thinking canvas
- Ideation templates
- Case studies of successful Arduino-based innovations

#### **Expected Outcomes:**

- ✓ Clear understanding of Design Thinking
- ✓ Validated problem statements
- ✓ Team-based ideation proposals



## **Day 2 (23.12.2025): Arduino Fundamentals & Rapid Prototyping**

### **Objective:**

Provide hands-on exposure to Arduino hardware and programming, enabling participants to build functional prototypes.

### **Concepts & Topics:**

- Introduction to Arduino Uno – architecture and features
- Arduino IDE installation and programming basics
- Digital & analog I/O concepts
- Sensors and actuators overview
  - Temperature, IR, Ultrasonic, LDR, Gas, Motion sensors
  - LEDs, buzzers, relays, DC motors, servo motors
- Interfacing sensors and actuators with Arduino
- Basics of circuit design and power management
- Introduction to rapid prototyping techniques

### **Hands-on Activities:**

- Writing and uploading Arduino programs
- Interfacing LEDs, sensors, and motors
- Reading sensor data and controlling outputs
- Building basic functional modules
- Testing and debugging Arduino circuits

### **Tools & Resources:**

- Arduino Uno boards
- Breadboards, jumper wires
- Sensors and actuator kits
- Arduino IDE, Fritzing (for circuit visualization)

### **Expected Outcomes:**

- ✓Ability to program Arduino
- ✓Hands-on experience with sensors and actuators
- ✓Working hardware modules for final prototype

## **Day 3 (24.12.2025): Prototype Development, Testing & Demonstration**

### **Objective:**

Enable participants to develop, test, and present a complete Arduino-based prototype using Design Thinking principles.

### **Concepts & Topics:**

- Integrating hardware modules into a complete system
- Prototype refinement and iterative improvement
- Testing, validation, and troubleshooting techniques
- User feedback and design iteration
- Documentation and presentation of prototypes
- Introduction to product commercialization and start-up ecosystem
- IPR, patent filing basics, and innovation funding opportunities

### **Hands-on Activities:**

- Final prototype development
- System testing and performance evaluation
- Preparing project documentation
- Prototype demonstration and pitching
- Feedback session and improvement suggestions

### **Evaluation & Certification:**

- Prototype functionality
- Innovation and problem relevance
- Team collaboration and presentation
- Participation and hands-on involvement

### **Expected Outcomes:**

- ✓Completed Arduino-based prototype
- ✓Enhanced problem-solving and innovation skills
- ✓Exposure to product development and entrepreneurship
- ✓Readiness for hackathons, IDEA Lab projects, and start-ups



## 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**

### **1. Introduction**

This report presents a comprehensive and detailed account of the Three Days Ideation Workshop on Rapid Prototyping through Design Thinking with Arduino, conducted from 22.12.2025 to 24.12.2025. The workshop was meticulously designed to provide participants with an experiential and immersive learning environment that integrates design thinking principles, engineering ideation techniques, and hands-on Arduino-based prototyping.

The programme aimed to bridge the gap between theoretical knowledge and real-world engineering practice by enabling participants to identify user-centric problems, conceptualize innovative solutions, and translate ideas into functional working prototypes. By combining creative thinking with embedded system fundamentals, the workshop aligned strongly with the objectives of AICTE IDEA Lab and NEP 2020.

### **2. Objectives of the Workshop**

The primary objectives of the workshop were:

- To introduce Design Thinking as a systematic methodology for engineering problem-solving
- To develop ideation skills for identifying real-world and societal problems
- To provide hands-on training in Arduino programming and hardware interfacing
- To promote rapid prototyping and iterative design approaches
- To enhance teamwork, creativity, communication, and innovation skills
- To motivate participants towards product development, start-ups, and research

### **3. About the Institution and AICTE IDEA Lab**

The institution is committed to excellence in technical education, innovation, and research. The AICTE IDEA Lab serves as a dedicated innovation ecosystem that encourages students and faculty to design, develop, and deploy technology-driven solutions.

The lab provides access to prototyping tools, embedded systems kits, mentoring support, and an interdisciplinary environment to nurture innovation and entrepreneurship.

#### **4. Workshop Planning and Methodology**

The workshop was planned with a balanced mix of:

- Expert lectures
- Interactive discussions
- Live demonstrations
- Hands-on hardware sessions
- Team-based ideation and challenges
- Guided prototype development and evaluation

Participants were divided into multidisciplinary teams to foster collaborative learning and peer-to-peer knowledge exchange.

#### **5. Day 1: Inauguration, Design Thinking & Arduino Fundamentals (22.12.2025)**

##### **5.1 Registration and Inaugural Session**

The first day of the workshop commenced with participant registration, during which attendees were briefed about the objectives, schedule, and expected outcomes of the programme. The inaugural session was formally inaugurated by the Principal and Chief Mentor, AICTE IDEA Lab, who welcomed the participants and emphasized the importance of innovation-driven learning in modern engineering education.

In his address, he highlighted the role of the AICTE IDEA Lab in nurturing creativity, design skills, and hands-on technical competence among students. He stressed that engineering education must move beyond conventional classroom teaching and focus on problem identification, solution ideation, and prototype development. His motivational address inspired participants to actively engage in the workshop and make optimal use of the learning opportunity.

## **5.2 Introduction to Design Thinking Philosophy**

The first technical session introduced participants to the Design Thinking philosophy, a human-centered approach to innovation widely adopted in industry and academia. The resource person explained the five stages of Design Thinking—Empathize, Define, Ideate, Prototype, and Test—and discussed their relevance to engineering problem-solving.

Participants learned how understanding user needs and societal challenges forms the foundation of effective engineering solutions. Through illustrative examples and case studies, the session demonstrated how Design Thinking helps engineers develop sustainable, user-friendly, and impactful products.

## **5.3 Engineering Ideation and Problem Identification**

This session focused on Engineering Ideation, where participants were trained to systematically identify and analyze real-world problems. Activities such as empathy mapping, stakeholder identification, and need analysis were conducted to help participants view problems from a user's perspective.

Participants worked in teams to observe, analyze, and discuss common challenges faced in daily life, industry, and society. They were guided to convert these observations into clear and concise engineering problem statements using structured frameworks such as “How Might We” questions.

## **5.4 Arduino Fundamentals: Hardware Architecture**

The post-lunch session introduced participants to the Arduino Uno development board. The facilitator explained the microcontroller architecture, pin configuration, clock frequency, power supply options, and onboard components. Participants were familiarized with digital and analog input/output pins and their applications in embedded systems.

The importance of proper power management, grounding, and safe handling of electronic components was also discussed to ensure reliable and safe prototyping.



## **5.5 Arduino Programming Basics and Hands-on Practice**

Participants were introduced to the Arduino Integrated Development Environment (IDE). The structure of Arduino sketches, including the `setup()` and `loop()` functions, was explained in detail. Participants learned to write, compile, and upload programs to the Arduino board.

In the hands-on segment, participants interfaced basic components such as LEDs, resistors, buzzers, and push buttons. They practiced fundamental programs using `digitalWrite()`, `digitalRead()`, conditional logic, and `delay` functions. This practical exposure helped participants gain confidence in both hardware connections and embedded programming.

## **5.6 Outcomes of Day 1**

At the end of Day 1, participants gained:

- ✓ A clear understanding of Design Thinking and engineering ideation
- ✓ Ability to identify user-centric problems
- ✓ Foundational knowledge of Arduino hardware and programming
- ✓ Confidence to proceed with advanced interfacing and prototyping

## **6. Day 2: Ideation Techniques, Sensor & Actuator Interfacing (23.12.2025)**

### **6.1 Recap Session and Team Reflection**

Day 2 began with a structured recap of the previous day's sessions. Participants discussed key takeaways from Design Thinking and Arduino fundamentals. This interactive reflection session encouraged peer learning and helped clarify doubts before progressing to advanced topics.

### **6.2 Advanced Ideation Techniques**

The session on advanced ideation techniques introduced tools such as Brainstorming, SCAMPER, Mind Mapping, and Reverse Thinking.

The facilitator explained how these techniques stimulate creativity and help generate multiple solution pathways for a single problem.

Participants applied these techniques in team activities, generating diverse ideas for their chosen problem statements. Teams evaluated ideas based on feasibility, impact, and resource availability, leading to the selection of concepts suitable for rapid prototyping.

### **6.3 Hands-on Session: Sensor Interfacing**

One of the most engaging sessions of the workshop was the hands-on sensor interfacing activity. Participants worked with various sensors, including LM35 temperature sensors, DHT11 temperature and humidity sensors, ultrasonic sensors, and IR sensors.

They learned how to connect sensors to the Arduino board, read sensor values, apply calibration techniques, and display data on the serial monitor. The session also covered threshold-based decision-making, enabling participants to trigger actions based on sensor inputs.

### **6.4 Real-Time Data Processing and Debugging**

Participants were introduced to basic concepts of real-time data processing and debugging techniques. They analyzed sensor data trends, handled noisy inputs, and improved program logic to ensure accurate and reliable readings. This session enhanced their understanding of embedded system behaviour in real-world conditions.

### **6.5 Actuator Interfacing and Control Techniques**

The post-lunch session focused on actuator interfacing, including DC motors, servo motors, stepper motors, relays, and display modules such as 16×2 LCDs. Participants learned about Pulse Width Modulation (PWM) and its application in controlling motor speed and position.

Hands-on exercises allowed participants to control actuators based on sensor inputs, enabling the creation of responsive systems.

## **6.6 Concept Sketching and System Design**

The final session of Day 2 involved concept sketching and system design. Teams prepared block diagrams, circuit layouts, and flowcharts for their proposed prototypes. This activity helped participants visualize system architecture, understand signal flow, and finalize component requirements.

## **6.7 Outcomes of Day 2**

By the end of Day 2, participants achieved:

- ✓ Strong ideation and concept evaluation skills
- ✓ Hands-on experience with sensors and actuators
- ✓ Ability to process real-time data using Arduino
- ✓ Well-defined system designs ready for prototype development

## **7. Day 3: Prototype Development, Testing & Demonstration (24.12.2025)**

### **7.1 Prototype Development Phase I**

Participants began assembling circuits, integrating sensors and actuators, and implementing control logic. Mentors guided teams in debugging hardware and software issues.

### **7.2 Prototype Development Phase II**

Teams refined their prototypes by optimizing code, improving performance, and adding features. Iterative testing ensured reliability and stability of the models.

### **7.3 Demonstration and Valedictory Session**

Each team presented their problem statement, ideation process, system design, and working prototype. The workshop concluded with a valedictory session and certificate distribution.

## **8. Prototypes Developed**

- ✓ Smart Water Level Monitoring System
- ✓ Automatic Street Light Controller
- ✓ Smart Waste Management System
- ✓ Temperature and Humidity Monitoring System

## **9. Evaluation Methodology**

Evaluation was based on innovation, problem relevance, prototype functionality, teamwork, and presentation skills.

## **10. Outcomes and Impact**

The workshop enhanced technical competence, creativity, teamwork, and problem-solving skills. Participants gained confidence in developing real-world engineering solutions.

## **11. Alignment with NEP 2020 and NBA**

The programme promoted experiential learning, innovation, and OBE practices, supporting accreditation requirements.

## **12. Conclusion**

The Three Days Ideation Workshop successfully achieved its objectives by integrating design thinking with hands-on Arduino prototyping. The enthusiastic participation and innovative prototypes demonstrated the effectiveness of the workshop in fostering engineering innovation.

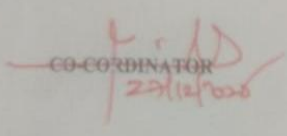




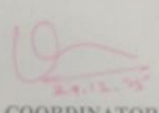
## PARTICIPANTS ATTENDANCE DETAILS

11	SAIGANDHINI N	14308	ECE	N Saigand	N Saigand	N Saigand	N Saigand	N Saigand	N Saigand
12	RAHUL RAJA B	14304	ECE	B. Rahul Raja	B. Rahul Raja	B. Rahul Raja	B. Rahul Raja	B. Rahul Raja	B. Rahul Raja
13	LOGESHWARAN M	14272	ECE	Logesh	Logesh	Logesh	Logesh	Logesh	Logesh
14	HARI VARSHA S.P.	14248	ECE	S. P. Hari Var	S. P. Hari Var	S. P. Hari Var	S. P. Hari Var	S. P. Hari Var	S. P. Hari Var
15	JEEVA A P	14259	ECE	Jeeva	Jeeva	Jeeva	Jeeva	Jeeva	Jeeva
16	HARSHAN K	14251	ECE	K. Harsh	K. Harsh	K. Harsh	K. Harsh	K. Harsh	K. Harsh
17	LOKESH.E	14273	ECE	E. Lokesh	E. Lokesh	E. Lokesh	E. Lokesh	E. Lokesh	E. Lokesh
18	KALAIVANI T	14261	ECE	Kalaivani.T	Kalaivani.T	Kalaivani.T	Kalaivani.T	Kalaivani.T	Kalaivani.T
19	BRINDHA G	14234	ECE	Brindha	Brindha	Brindha	Brindha	Brindha	Brindha
20	BHARATHI P	14231	ECE	Bharathi P	Bharathi P	Bharathi P	Bharathi P	Bharathi P	Bharathi P
21	JAGADEESH B	14252	ECE	B. Jagade	B. Jagade	B. Jagade	B. Jagade	B. Jagade	B. Jagade
22	ELANTHIRAIYAN V	14242	ECE	V. Elanthir	V. Elanthir	V. Elanthir	V. Elanthir	V. Elanthir	V. Elanthir
23	GOWSHIC M	14244	ECE	G. M. Gow	G. M. Gow	G. M. Gow	G. M. Gow	G. M. Gow	G. M. Gow
24	INDHRAJITH L	14329	ECE	L. Indhraj	L. Indhraj	L. Indhraj	L. Indhraj	L. Indhraj	L. Indhraj
25	JAGANNATHAN S.	14253	ECE	S. Jagannath	S. Jagannath	S. Jagannath	S. Jagannath	S. Jagannath	S. Jagannath
26	MOHANRAJ V	14281	ECE	V. Mohanra	V. Mohanra	V. Mohanra	V. Mohanra	V. Mohanra	V. Mohanra
27	MOTHISH S	14285	ECE	S. Mothish	S. Mothish	S. Mothish	S. Mothish	S. Mothish	S. Mothish


28	LATHIKA SRI A	14271	ECE	A. Lathika	A. Lathika	A. Lathika	A. Lathika	A. Lathika	A. Lathika
29	AKASH S	14221	ECE	S. Akash	S. Akash	S. Akash	S. Akash	S. Akash	S. Akash
30	HARAN M R	14246	ECE	M. R. Haran	M. R. Haran	M. R. Haran	M. R. Haran	M. R. Haran	M. R. Haran
31	B VERONIKA	13758	CSE	Veronika	Veronika	Veronika	Veronika	Veronika	Veronika
32	SATHISH P	13732	CSE	P. Sathish	P. Sathish	P. Sathish	P. Sathish	P. Sathish	P. Sathish
33	POOJA K	14293	ECE	K. Pooja	K. Pooja	K. Pooja	K. Pooja	K. Pooja	K. Pooja



CO-ORDINATOR  
22/12/2020















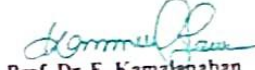
COORDINATOR



CHIEF MENTOR  
24/12/2020

## SAMPLE CERTIFICATES

		<b>Vel Tech High Tech</b> Dr. Rangarajan Dr. Sakunthala Engineering College Approved by AICTE, New Delhi   Affiliated to Anna University, Chennai An Autonomous Institution		
	<b>VEL TECH HIGH TECH- AICTE IDEA LAB</b> <b>CERTIFICATE OF APPRECIATION</b>			
<p>This is to certify that Mr./Ms. <u>AMAAN ALI SHAIKH</u> of <u>II</u> Year student of the Department of <u>Electronics and Communication Engineering</u> has participated in <u>Three days Ideation Workshop on Rapid Prototyping through design thinking with Arduino</u></p> <p>organized by <b>VEL TECH HIGH TECH - AICTE IDEA LAB</b> at Vel Tech High Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Avadi, Chennai, Tamil Nadu, India during 22-Dec-2025 to 24-Dec-2025.</p>				
 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		

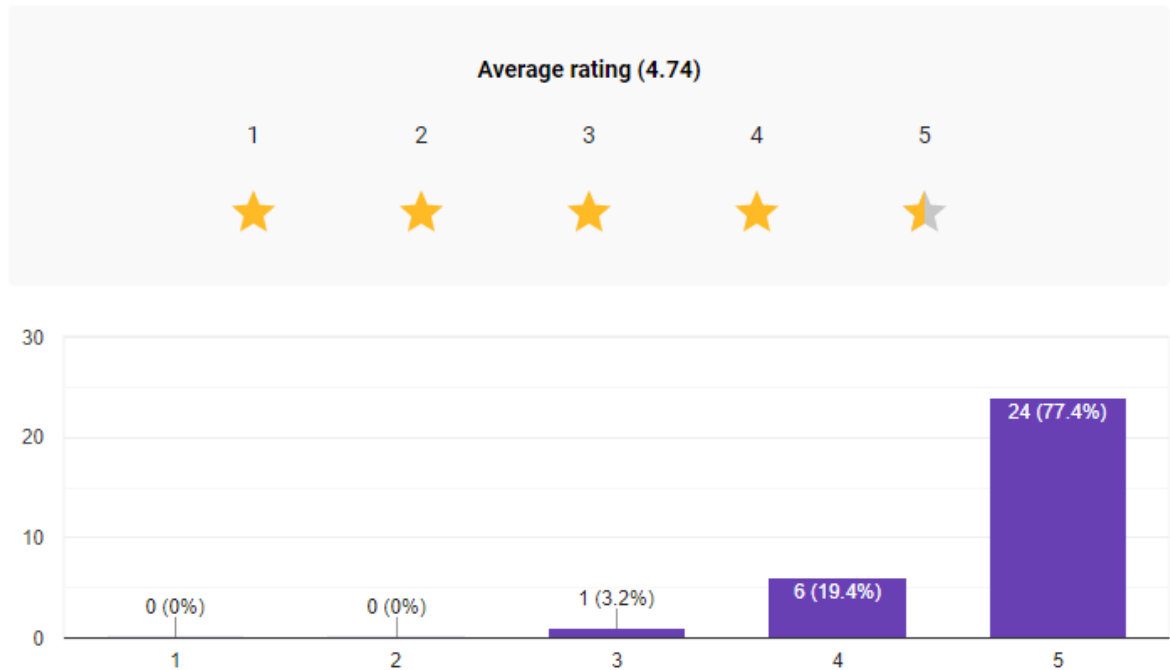
		<b>Vel Tech High Tech</b> Dr. Rangarajan Dr. Sakunthala Engineering College Approved by AICTE, New Delhi   Affiliated to Anna University, Chennai An Autonomous Institution		
	<b>VEL TECH HIGH TECH- AICTE IDEA LAB</b> <b>CERTIFICATE OF APPRECIATION</b>			
<p>This is to certify that Mr./Ms. <u>HARINI S</u> of <u>II</u> Year student of the Department of <u>Electronics and Communication Engineering</u> has participated in <u>Three days Ideation Workshop on Rapid Prototyping through design thinking with Arduino</u></p> <p>organized by <b>VEL TECH HIGH TECH - AICTE IDEA LAB</b> at Vel Tech High Tech Dr. Rangarajan Dr. Sakunthala Engineering College, Avadi, Chennai, Tamil Nadu, India during 22-Dec-2025 to 24-Dec-2025.</p>				
 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		

## PARTICIPANTS FEEDBACK

 Copy chart

1. Clarity of workshop objectives and expected learning outcomes.

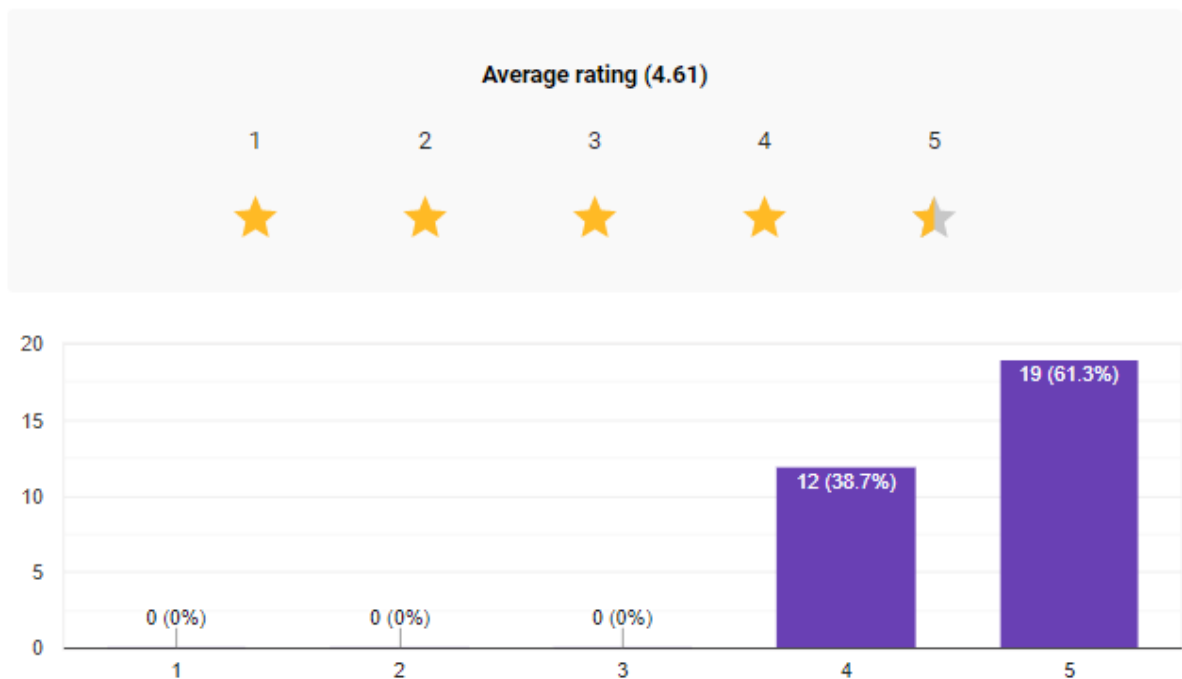
31 responses



2. How would you rate the overall quality of the program

 Copy chart

31 responses



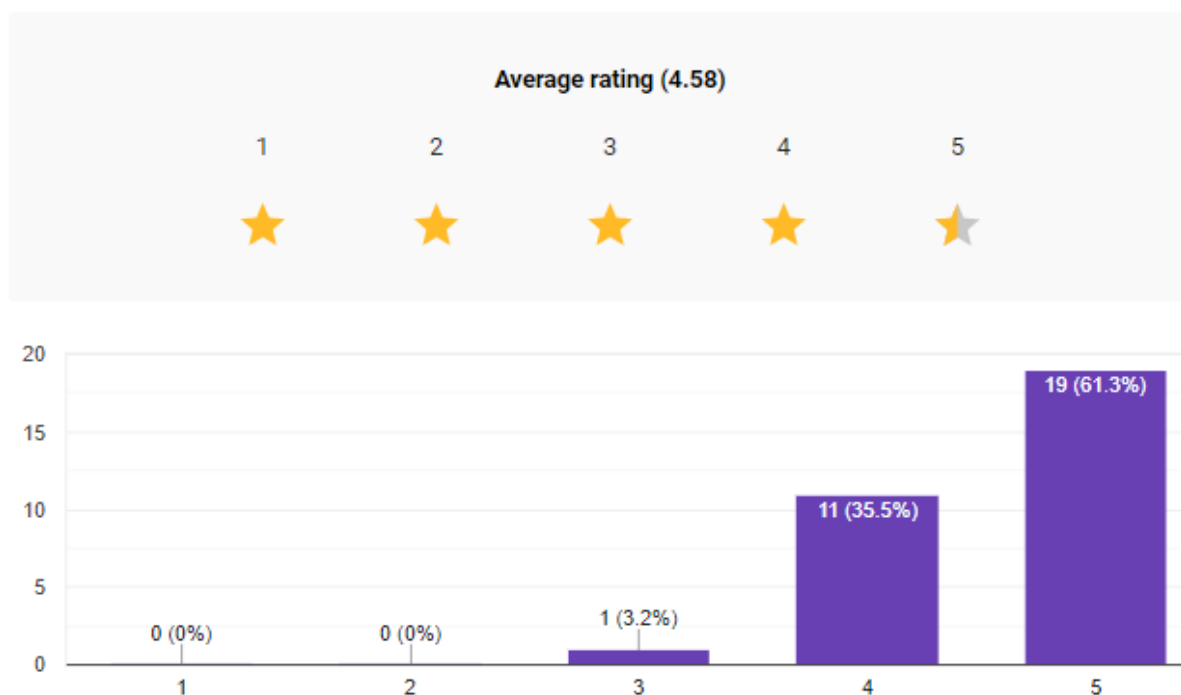


## PARTICIPANTS FEEDBACK

3. The topics covered in design thinking with Arduino is relevant and useful.

 [Copy chart](#)

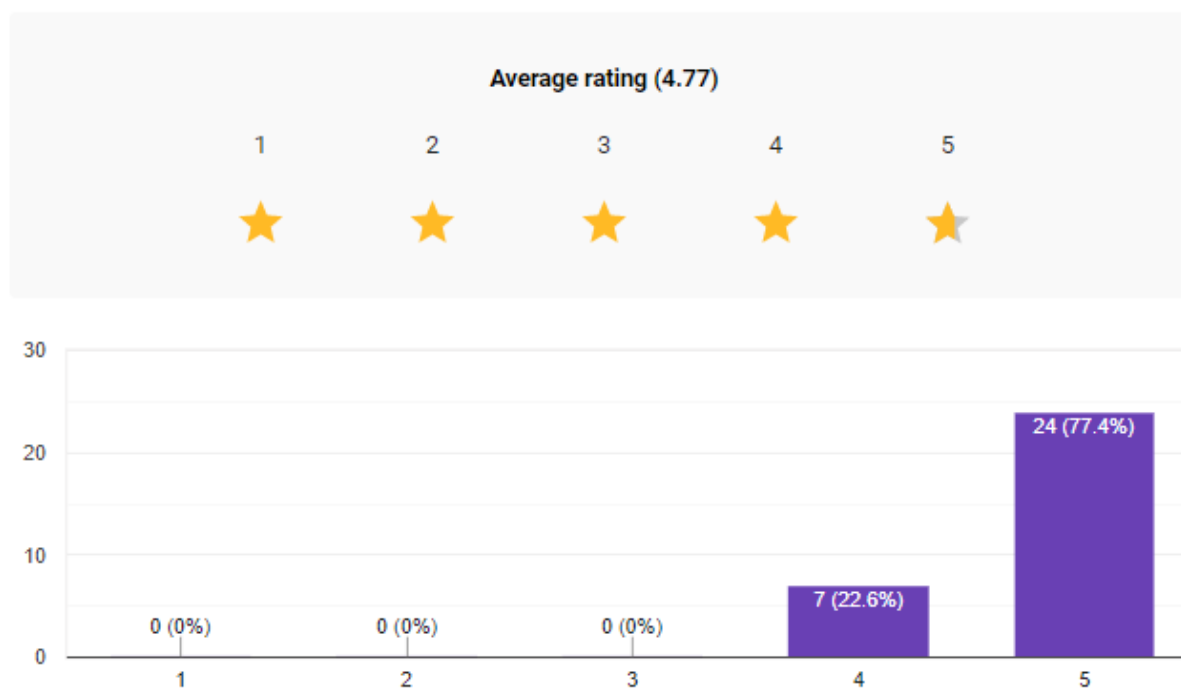
31 responses



4. Rate the clarity and effectiveness of the resource person(s).

 [Copy chart](#)

31 responses

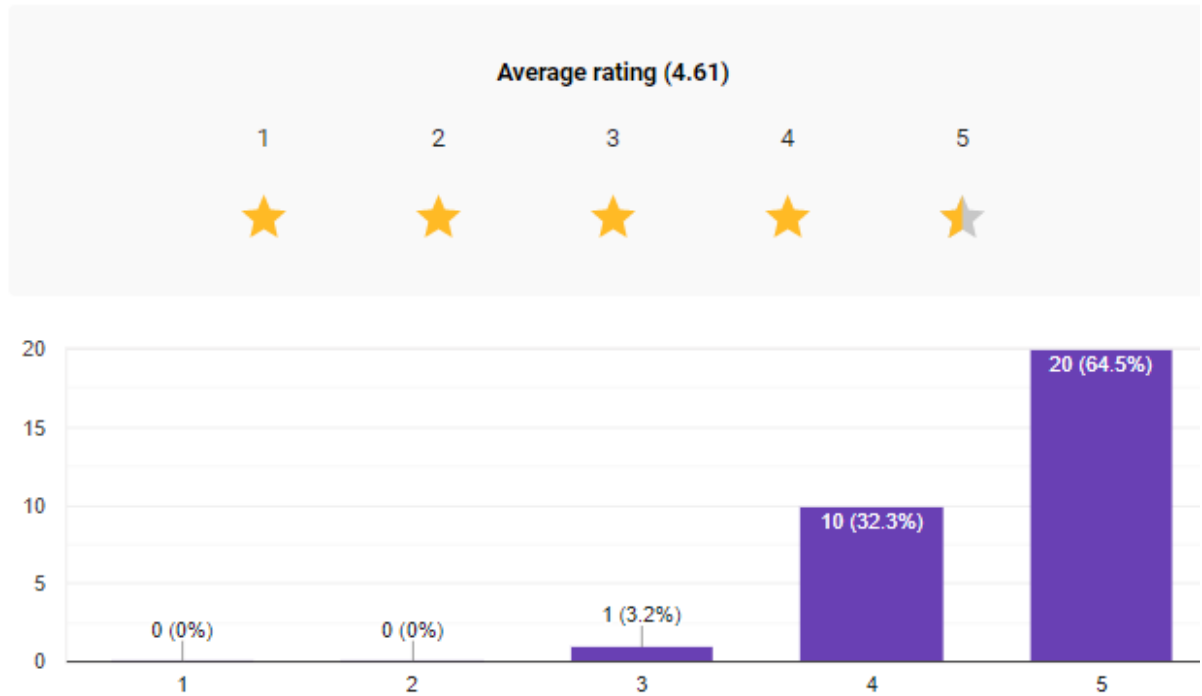


## PARTICIPANTS FEEDBACK

5. How helpful were the hands-on practice sessions?

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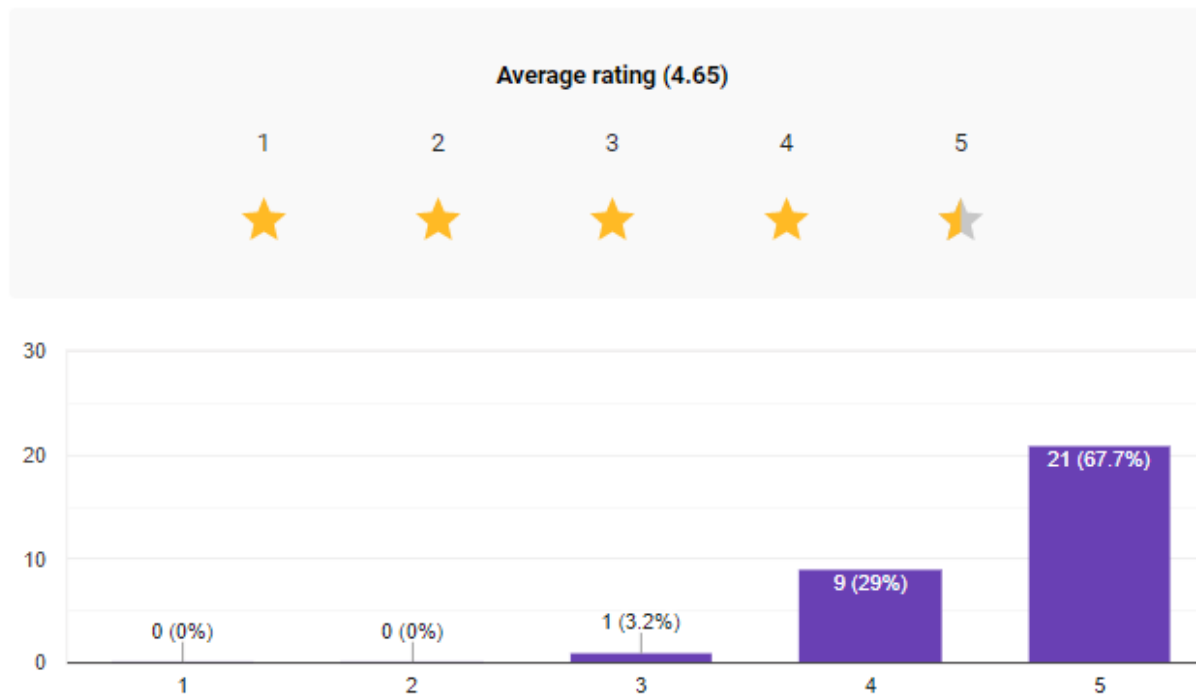
31 responses



6. How do you rate the organization and flow of the training sessions?

 Copy chart

31 responses



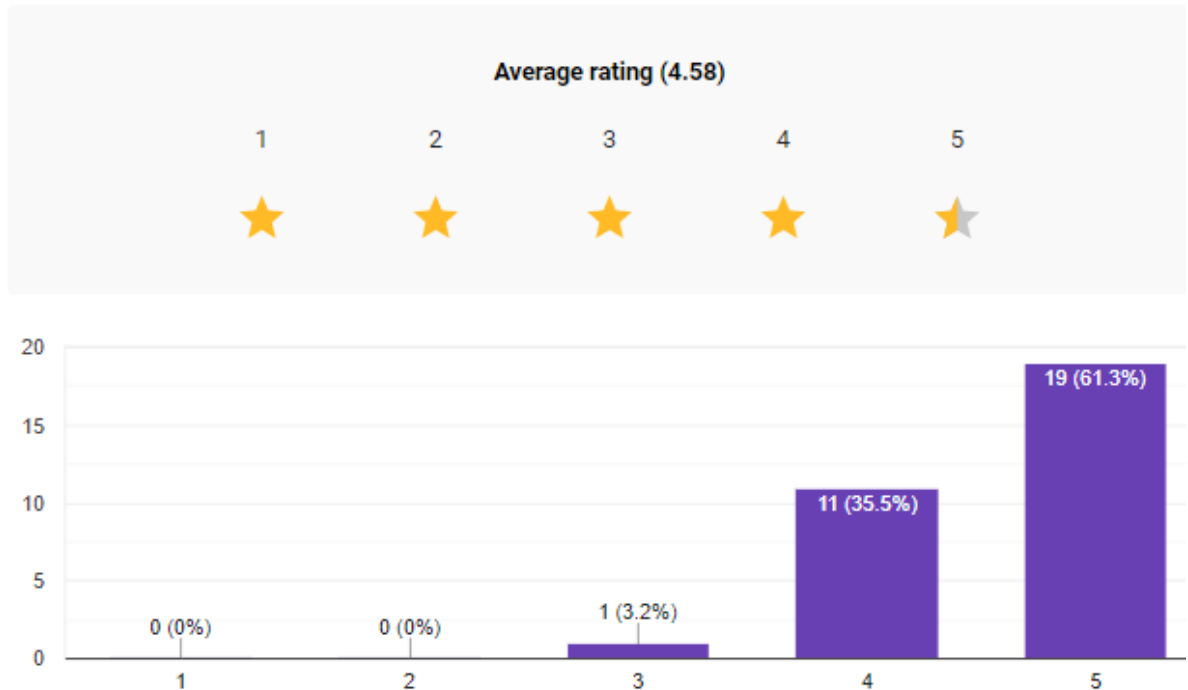


## PARTICIPANTS FEEDBACK

7. I am confident in using Arduino for engineering computations after the program.

31 responses

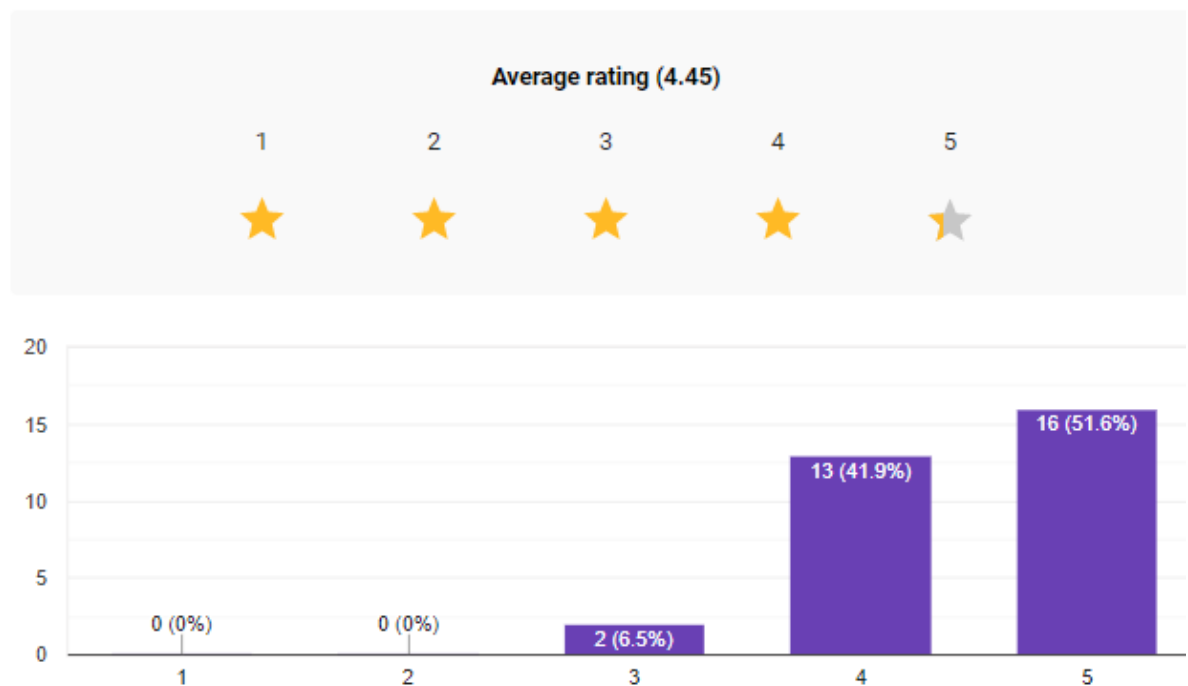
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8. I am confident in using Arduino for simulation and modeling applications.

31 responses

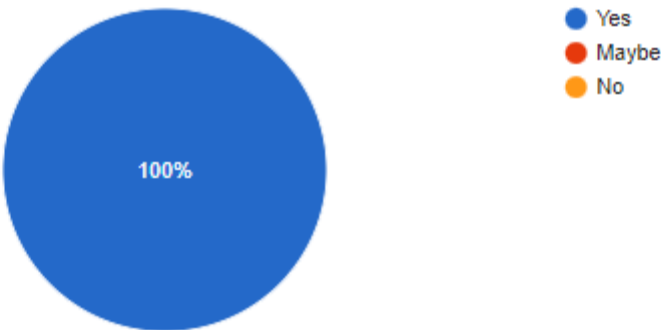
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# PARTICIPANTS FEEDBACK

9. Would you recommend this program to others?

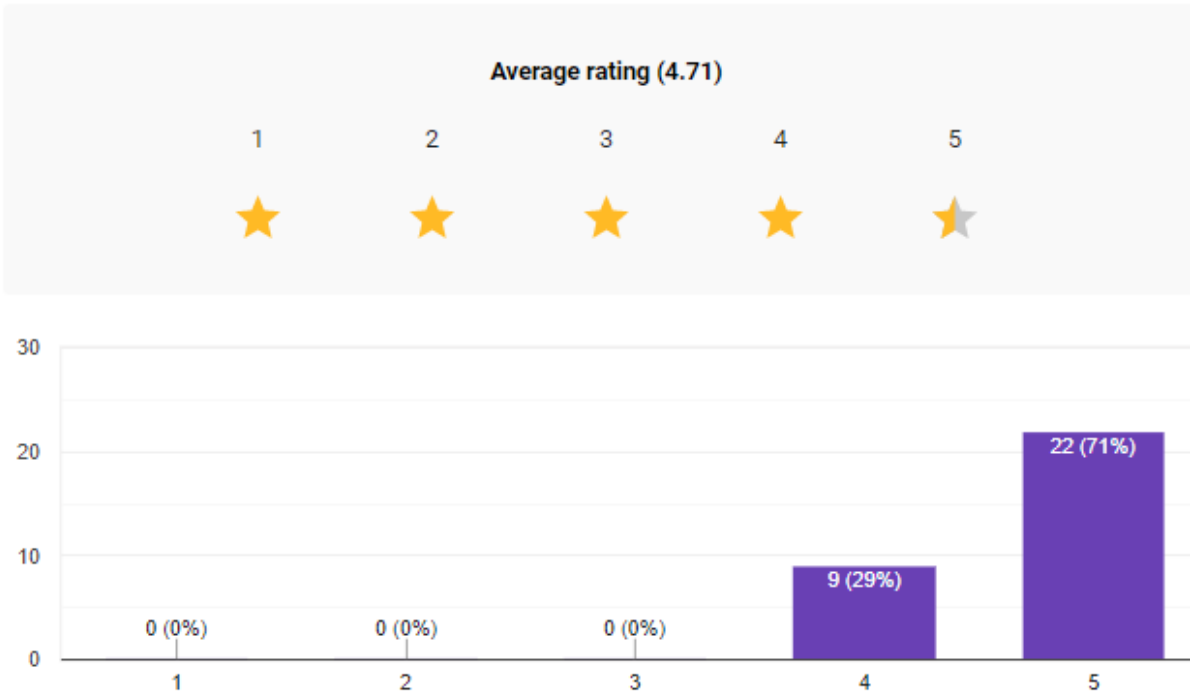
31 responses



10. Overall usefulness of the program in enhancing your technical and design skills

31 responses

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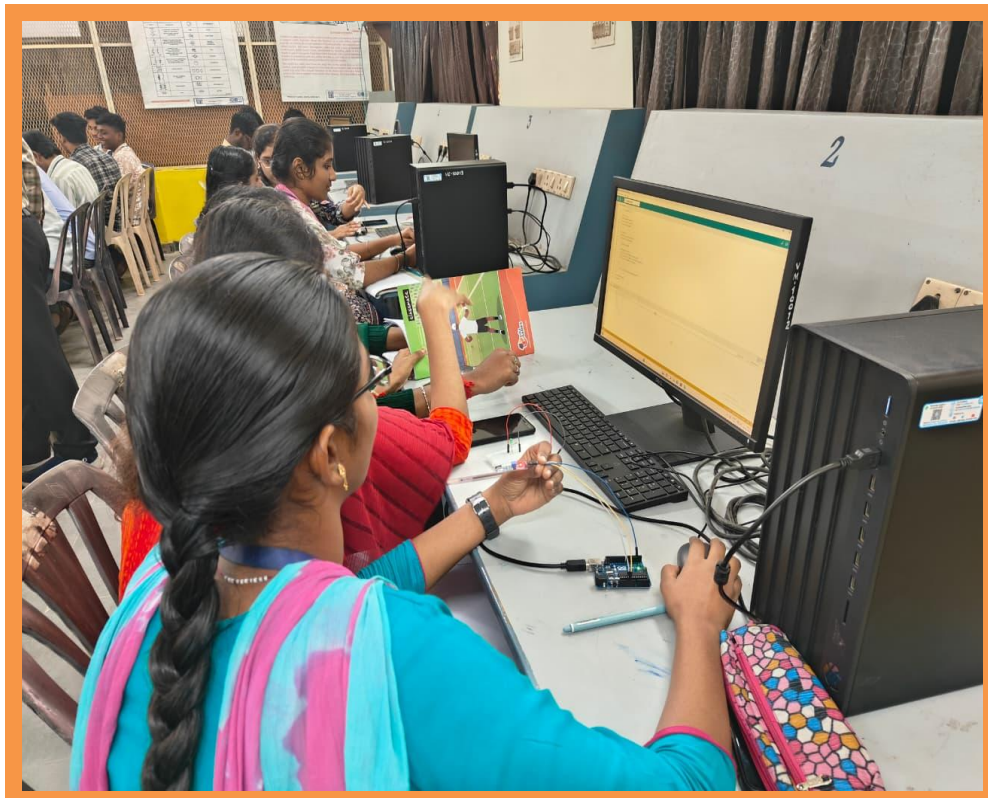
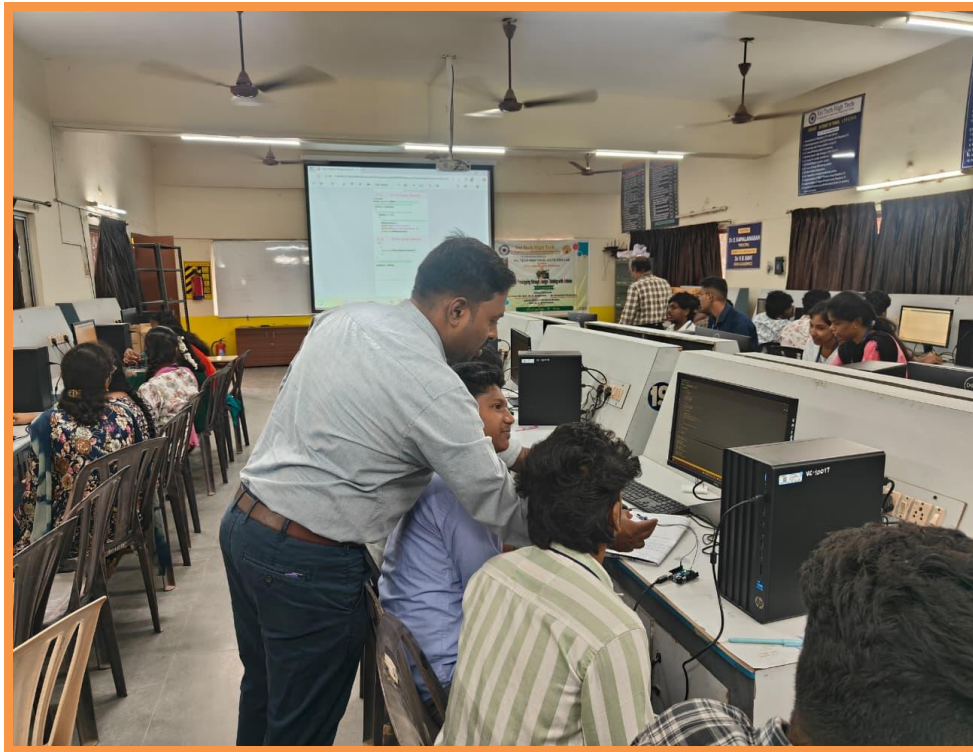


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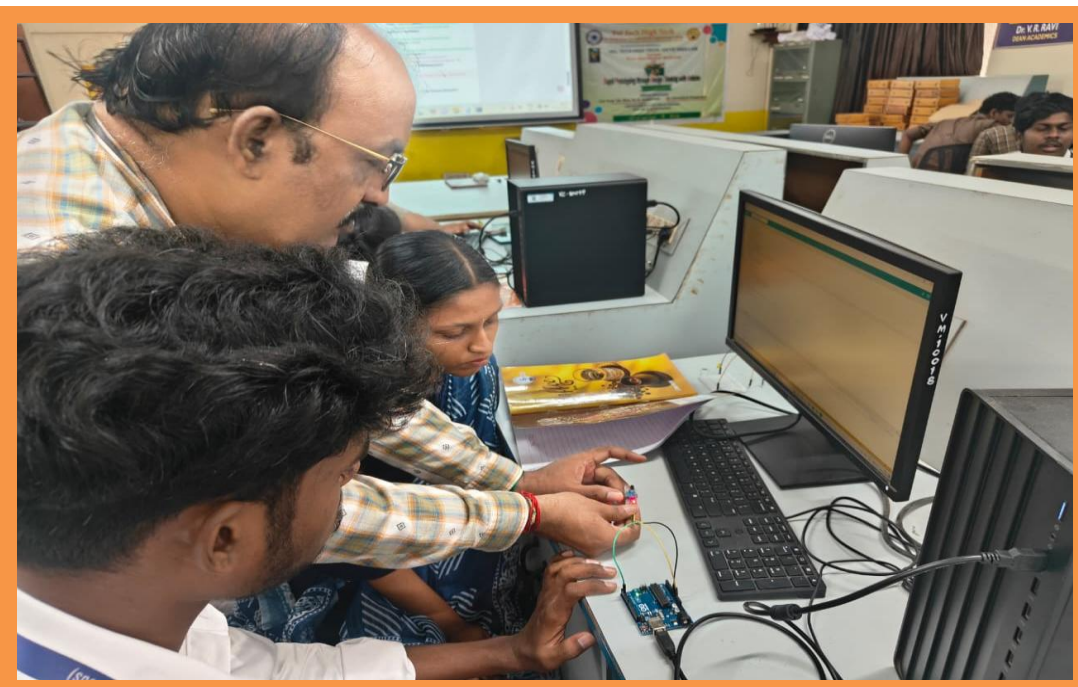
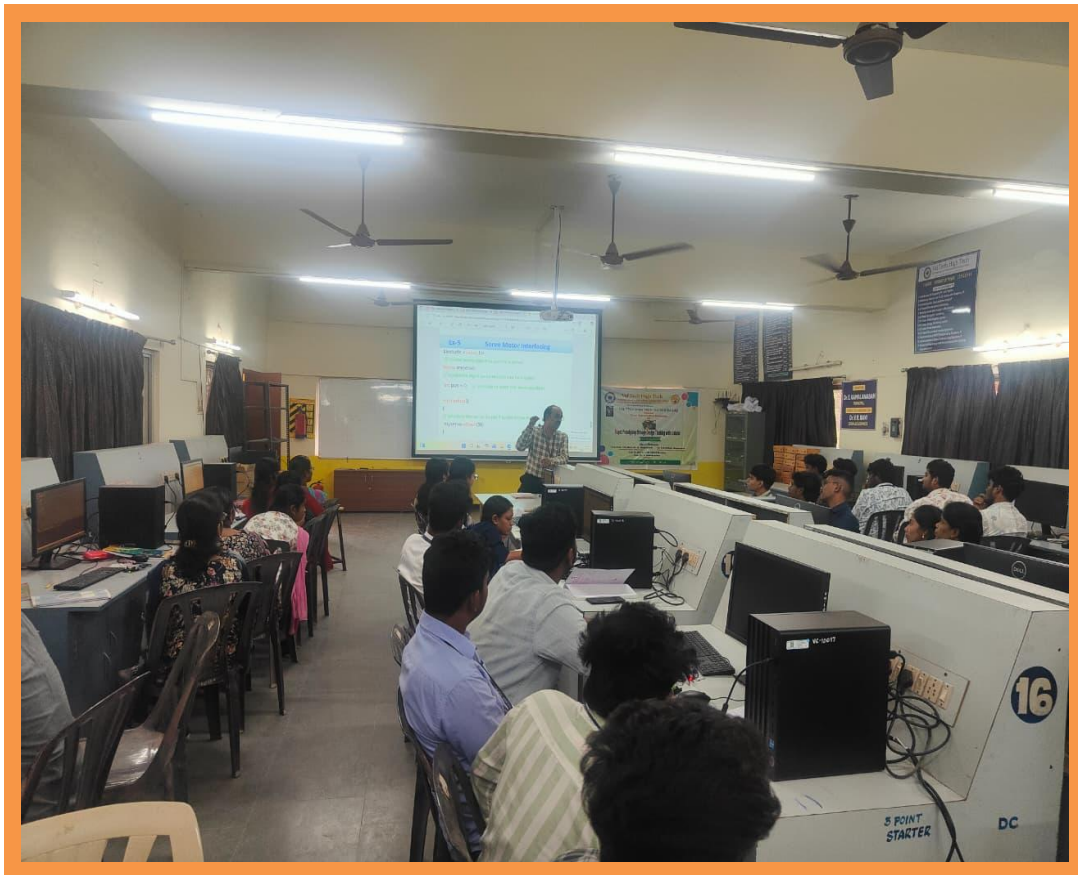




## PHOTO GALLERY



## PHOTO GALLERY





## **EXPENSE STATEMENT**

<b>S.NO</b>	<b>ITEM DESCRIPTION</b>	<b>DATE</b>	<b>BILL NO</b>	<b>AMOUNT (Rs)</b>
1	Poster	18.12.25	633	71
2	Brochure	19.12.25	638	70
3	Banner	21.12.25	19668	500
4	Certificate	23.12.25	647	390
5	Miscellaneous (Buzzer)	23.12.25	47	240
	<b>Total</b>			<b>1271</b>

**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**

# BILL COPY

E SPARES  
279 C. T. H. ROAD  
AUNDI CHENNAI-54  
CELL- 9444400288  
GSTIN-33ANJPF5911E2Z5

BILL NO: 47		DATE: 22/12/25	
		TIME: 06:08	
ITEM NAME	QTY	PRICE	AMOUNT
BUZER	12 No	20.00	240.00
TOTAL ITEM(S): 1 /QTY:12.000			240.00
TOTAL			₹240.00

GOODS ONCE SOLD CANNOT BE TAKEN BACK  
OR EXCHANGED WARRANTY FROM  
MANUFACTURE ONLY

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

IN TIME: 8.40  
DATE: 23.12.25  
SL NO: 4282  
SIGN: [Signature]



MATERIAL RECEIVED  
DATE: [Signature]  
SIGN: [Signature]

VEL TECH  
NORTH CAMPUS - INWARD  
DATE 23.12.25 IN TIME 8.35 AM  
VEHICLE NO By hand  
PO NO  
SL NO DRS 2528  
SIGN B

VEL TECH  
NORTH CAMPUS  
QUANTITY VERIFIED  
NAME Balesubraman  
SIGN By  
DATE 23.12.25

## 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. **647** Date: **23/12/25**  
Mr./Ms. **Vel-Tech - high tech**  
Customer GST :

S.No	Qty	Partuculars	Rate	Amount
1	33	Certificate	10	330
			Amount	330
			SGST 9%	30
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Thank you

# BILL COPY

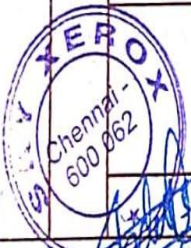
**CASH BILL**  
**sky XEROX**

#13, Rani Nagar, Almathi Road, Tiruvallur, Chennai - 600062  
☒ skyxeroxchennai@gmail.com 7339221595 6380477074  
**GST No. : 33AFBFS4993Q1Z7**

**XEROX, PRINTS, BINDING, LAMINATION, STATIONARIES**

Bill No. **633** Date: **18/12/25**  
 Mr./Ms. **Velfech - high tech**  
 Customer GST: **33AABTV8852A1ZK**

S.No	Qty	Particulars	Rate	Amount
1	2	Acp F/B poster	30	60
			Amount	60
			SGST 9%	5.4
			CGST 9%	5.4
			TOTAL	71

 Thank you


**CASH BILL**  
**sky XEROX**

#13, Rani Nagar, Almathi Road, Tiruvallur, Chennai - 600062  
☒ skyxeroxchennai@gmail.com 7339221595 6380477074  
**GST No. : 33AFBFS4993Q1Z7**



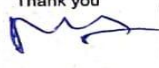
**XEROX, PRINTS, BINDING, LAMINATION, STATIONARIES**

Bill No. **638** Date: **19/12/25**  
 Mr./Ms. **Vel-Pich high-Tech**  
 Customer GST:

S.No	Qty	Particulars	Rate	Amount
1	2	Brochure	30	60
			Amount	60
			SGST 9%	5
			CGST 9%	5
			TOTAL	70

 Thank you

## BILL COPY

	<b>T.SARAVANA KUMAR B.E.,</b> 99 52 79 79 80 044 - 47777998		<b>T.LAKSHMANA KUMAR B.E.,</b> 81 89 90 6004 89 25 71 777 9	
	<b>SLK DIGITAL</b> <b>PRINTING SOLUTION</b> 253,N.M ROAD, NEW MUNICIPAL OPP, AVADI-54 slkdigital@gmail.com --FLUX--VINYL--LIGHTING BOARD--BROCHERS--VISITING CARDS--ACRYLIC WORK			
BILL NO: 17668		Date: 21/12/2025		
To: VGL TECH HINH TECH ACD IDA LAB				
S.NO	DESCRIPTION	QTY	RATE/UNIT	AMOUNT
1	6x4 Bames	2	500	500
TOTAL				500
Contact: 9659741118				
Advance: _____				
Cash mode: <input type="checkbox"/> cash <input type="checkbox"/> check <input type="checkbox"/> card <input type="checkbox"/> credit <input checked="" type="checkbox"/> account transfer				
				Thank you  SLK DIGITAL