



R. C. PATEL

INSTITUTE OF TECHNOLOGY, SHIRPUR

An Autonomous Institute



ENERGY CLUB

ACTIVITIES REPORT 2025-26



DEPARTMENT OF ELECTRICAL ENGINEERING



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ABOUT ENERGY CLUB

The Energy Club of our institute is dedicated to fostering awareness and understanding of diverse energy-related topics, ranging from renewable energy sources to sustainable practices. The club provides a vibrant platform for students to explore, discuss, and contribute to the ever-evolving field of energy through interactive events, workshops, seminars, and discussions.

Members actively collaborate on projects that promote energy conservation and advocate cleaner and greener solutions. By nurturing innovation and knowledge sharing, the club aims to inspire the next generation of leaders committed to tackling global energy challenges.

To enrich students' real-world understanding, the club regularly organizes industrial visits, expert talks, and hands-on sessions with professionals from the energy sector. Overall, the Energy Club plays a crucial role in empowering students to make a meaningful contribution toward energy efficiency and sustainability.

VISION

To be a dynamic platform that inspires students to innovate, explore, and lead in the field of sustainable energy by promoting technical excellence, environmental responsibility, and research-driven solutions for a greener future.

MISSION

- To create awareness about renewable energy, energy conservation, and sustainable engineering practices through technical activities, workshops, seminars, and outreach programmes.
- To enhance students' practical knowledge and technical skills through hands-on learning, industrial interactions, innovation competitions, and research activities.
- To encourage interdisciplinary collaboration, leadership, teamwork, and professional ethics while addressing real-world energy challenges.
- To promote emerging technologies such as Electric Vehicles (EVs), IoT, Embedded Systems, Smart Grids, Automation, and Clean Energy Solutions.
- To contribute towards societal development by organizing community outreach programmes and supporting the achievement of the United Nations Sustainable Development Goals (SDGs).



CLUB CONSTITUTION

Position	Designation	Name / Detail
Faculty Advisor	Head of Department	Prof. Dr. Shailaja Arjun Patil
Faculty Coordinator	Coordinator	Prof. Krunalkumar Jitendrakumar Gandhi
Student Coordinator	Student (TY-Electrical)	Pragati Subhash Patil
Student Coordinator	Student (TY-Electrical)	Shreyas Ganesh Pawar
Secretary	Student (TY-Electrical)	Vishvpratap Singh
Members	28 Student Members (TY & Final – Electrical)	Full roster in Annexure I

ANNEXURE I: CLUB MEMBER ROSTER

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ACTIVITY - 1

EVENT REPORT

Event: Poster Making Competition on Energy Sustainability and Green Innovations

Venue: Drawing Hall, First Floor, RCPIT

Organized by: Energy Club, R. C. Patel Institute of Technology, Shirpur

Date: 04 October 2025

Themes:

- Energy Sustainability
- Renewable Energy
- Green Energy

INTRODUCTION

The Energy Club of the Department of Electrical Engineering, R. C. Patel Institute of Technology, Shirpur, organized a Poster Making Competition on October 4, 2025, at 3:00 PM in the Drawing Hall.

The initiative was undertaken to provide students with a creative platform to express innovative ideas and perspectives on critical issues such as energy conservation, sustainability, and renewable energy technologies. The event also marked the re-opening of the Energy Club, reinforcing its commitment to fostering awareness, innovation, and sustainable practices among budding engineers.

The competition served as both a creative engagement and a learning activity, encouraging participants to visualize the challenges and opportunities within the energy domain through art and design.

OBJECTIVES OF THE WORKSHOP

The primary objectives of the Poster Making Competition were to:

- Enhance student awareness of global and local energy challenges.
- Encourage creative expression related to energy sustainability, conservation, and renewable technologies.
- Develop a sense of social and environmental responsibility among students.
- Foster interdisciplinary participation by involving students from different engineering branches.
- Re-launch the Energy Club as a dynamic platform for experiential learning and innovation in the energy sector.

PLANNING

The activity was meticulously planned by the Energy Club under the guidance of the Department of Electrical Engineering. The organizing committee finalized the event schedule, competition themes, evaluation criteria, venue arrangements, and judging panel well in advance. The competition was scheduled on 04 October 2025 at the Drawing Hall, RCPIT, and was open to First Year and Second Year students from all engineering disciplines. Three major themes—Energy Sustainability, Renewable Energy, and Green Energy—were selected to align the activity with current technological and environmental challenges. Rules regarding originality, handmade posters, evaluation methodology, and time schedule were communicated to all participants through the event brochure and departmental notices. Faculty members were appointed as judges to ensure transparency and fairness in evaluation.

EXECUTION

The programme commenced with the inaugural ceremony and the official reopening of the Energy Club in the presence of Dr. J. B. Patil, Director, RCPIT, along with faculty members of the Electrical Engineering Department. During the inaugural session, the objectives of the Energy Club and its future roadmap were presented to the students, highlighting the importance of innovation and sustainability in engineering education.



Following the inauguration, the competition was conducted according to the planned schedule. A total of 19 students enthusiastically participated in the event and prepared handmade posters illustrating innovative concepts related to clean energy, renewable resources, energy conservation, and environmental sustainability. Participants effectively combined engineering knowledge with artistic creativity to communicate technical concepts through visual representation.

The posters were evaluated by an expert faculty panel based on predefined parameters including relevance to the theme, creativity, originality, artistic presentation, and clarity of technical concepts. The winners were felicitated with



certificates and appreciation, while all participants received encouragement for their active involvement. The event concluded with a vote of thanks and a commitment to organize similar activities under the Energy Club.

OUTCOMES

After successful completion of the activity, students were able to:

- Understand the importance of renewable energy and sustainable engineering practices.
- Identify current energy challenges and propose innovative solutions through creative visualization.
- Improve technical communication and presentation skills.
- Demonstrate environmental awareness and social responsibility.
- Enhance critical thinking, creativity, and problem-solving abilities.
- Appreciate interdisciplinary collaboration in addressing sustainability issues.
- Develop motivation to participate in future Energy Club activities and technical competitions.

IMPACT

The activity created a positive academic environment by promoting awareness of sustainable development and responsible energy utilization among students. It encouraged learners to think beyond classroom learning and apply engineering concepts creatively to address real-world environmental issues. The competition strengthened students' communication, analytical, and presentation skills while fostering teamwork and healthy competition.

The initiative also reinforced the institute's commitment towards sustainable engineering education and contributed to the development of socially responsible graduates. The successful re-launch of the Energy Club established a strong foundation for future student-driven technical activities, innovation challenges, and community awareness programmes related to energy conservation and renewable technologies.



PO / PSO MAPPING

PO / PSO	Level	Justification
PO1	2	Applied engineering knowledge to understand renewable energy concepts and sustainability challenges.
PO2	2	Analysed existing environmental issues and interpreted engineering solutions through posters.
PO3	2	Developed innovative visual concepts demonstrating sustainable engineering practices.
PO7	3	Promoted environmental sustainability, clean energy, and responsible engineering practices.
PO9	2	Encouraged collaborative learning and active student participation.
PO10	3	Enhanced technical communication through effective visual presentation of engineering concepts.
PSO1	2	Increased awareness of renewable energy resources and sustainable power systems.
PSO2	1	Encouraged understanding of electrical technologies supporting green energy applications.
PSO3	2	Motivated students to explore innovative and intelligent solutions for sustainable energy systems.

SDG MAPPING

SDG	Description	Relevance
SDG 4	Quality Education	Promoted experiential and creative learning.
SDG 7	Affordable and Clean Energy	Created awareness regarding renewable and sustainable energy.
SDG 9	Industry, Innovation and Infrastructure	Encouraged innovation and engineering creativity.
SDG 11	Sustainable Cities and Communities	Promoted sustainable lifestyle and environmental responsibility.
SDG 12	Responsible Consumption and Production	Encouraged efficient use of natural resources.
SDG 13	Climate Action	Raised awareness about climate change mitigation through clean energy solutions.

EVIDENCE





LIST OF PARTICIPANTS

Sr. No.	Name	Format	Grade
1	Riya Manohar Nikam	Hard Copy	8.5
2	Darshan Ravindra Chaudhari	Hard Copy	5
3	Kunika Mahendra Khairnar	Hard Copy	8
4	Janhavi premraj patil	Hard Copy	7
5	Kaveri Rangrao patil	Hard Copy	4
6	Patil Pranav	Hard Copy	5
7	Jayesh Rajendra Mali	Hard Copy	9
8	Janhvi Padmakar Marathe	Soft Copy	8
9	Kuldip Devendra Sonawane	Soft Copy	6
10	Disha Pankaj Kirange	Soft Copy	7
11	Chetan Ranjit Gosavi	Soft Copy	4
12	Mayur Navneet Marathe	Soft Copy	5
13	Krushna Patil	Soft Copy	8
14	Tejas Sharad Patil	Soft Copy	6
15	Dishant Hiralal Pawar	Soft Copy	6
16	Ketan Rajendra Patil	Soft Copy	4
17	Chirag Sudam Patil	Soft Copy	4
18	Jayesh Ravindra Patil	Soft Copy	5
19	Durgesh Sandip Chavan	Soft Copy	4



RESULTS AND RECOGNITION

The results were declared at 5:45 PM by Ms. Disha Patil and Ms. Sanjana Sonawane. The winners were felicitated with certificates and appreciation from the Director.

Position	Name	Remarks
First Prize	Jayesh Rajendra Mali	Exceptional creativity and clarity of concept
Second Prize	Riya Manohar Nikam	Strong visual appeal and originality
Third Prize	1) Janhavi Padmakar Marathe 2) Krushna Patil	Joint award for impressive conceptual representation
Consolation Prize	Disha Pankaj Kirange	Notable effort and thematic relevance

ACTIVITY HIGHLIGHTS

- Successful reopening of the Energy Club through a student-centric technical activity.
- Participation of 19 students from multiple engineering disciplines.
- Inauguration by Dr. J. B. Patil, Director, RCPIT.
- Innovative handmade posters showcasing renewable energy and green technologies.
- Transparent evaluation by expert faculty members.
- Recognition of outstanding student creativity through certificates and awards.
- Departmental exhibition of posters to promote sustainability awareness across the campus.
- Effective alignment with NBA Outcome-Based Education (OBE) philosophy and multiple UN Sustainable Development Goals (SDGs).



ACTIVITY - 2

WORKSHOP REPORT

Event: Microcontroller and Sensors Workshop

Venue: A.R. Patel School, Shirpur

Organized by: Energy Club, R. C. Patel Institute of Technology, Shirpur

Date: 14 October 2025

INTRODUCTION

The Energy Club of R. C. Patel Institute of Technology, Shirpur organized a one-day “Microcontroller and Sensors Workshop” at A.R. Patel School, Shirpur on 14th October 2025.

The workshop aimed to create early awareness among school students about electronics, automation, and embedded systems, emphasizing how microcontrollers and sensors form the backbone of modern technology.

This outreach initiative was part of the club’s ongoing efforts to promote STEM education, encourage curiosity about energy-efficient technologies, and demonstrate how innovation begins with fundamental concepts.

OBJECTIVES OF THE WORKSHOP

The key objectives of the workshop were:

- To introduce school students to basic electronic components and their applications.
- To provide an understanding of microcontrollers and how they are used to control devices.
- To explain the role of sensors in modern automation systems.
- To motivate students to pursue careers in engineering and technology.
- To provide hands-on learning through live demonstrations and practical sessions.
- To strengthen the connection between technical institutes and local schools by fostering collaborative learning.



PLANNING

The Energy Club of the Department of Electrical Engineering planned a one-day Microcontroller and Sensors Workshop as an outreach initiative for students of A. R. Patel School, Shirpur. Prior to the event, the organizing committee coordinated with the school authorities to finalize the schedule, participant registration, venue arrangements, and laboratory facilities. Resource persons were assigned to conduct individual technical sessions on electronics, microcontrollers, sensors, and embedded systems. Arduino boards, sensor modules, electronic components, demonstration kits, and presentation materials were prepared in advance to ensure an effective learning experience. The workshop schedule was designed to include theory sessions, live demonstrations, practical activities, and an interactive quiz, thereby providing a balanced blend of conceptual and experiential learning.

EXECUTION

The workshop was conducted on 14 October 2025 at A. R. Patel School, Shirpur, with active participation from 85 students of Classes VI to X, accompanied by four faculty members. The programme commenced with an inaugural session introducing the objectives of the Energy Club and highlighting the importance of early exposure to electronics, automation, and sustainable technologies.

The technical sessions covered the fundamentals of electronic components, working principles of microcontrollers, and applications of various sensors in modern automation systems. Real-life examples, interactive models, and simulation videos were used to simplify technical concepts and make the sessions engaging for school students.

The afternoon session was conducted in the Atal Tinkering Laboratory, where students participated in hands-on activities using Arduino boards and sensor modules. Practical demonstrations included LED blinking, PIR sensor-based motion detection, temperature sensing with automatic fan control, and smart lighting systems. Students actively assembled circuits, observed outputs, and interacted with the technical team to understand the practical implementation of embedded systems. The workshop concluded with an interactive quiz, feedback session, and appreciation of active participants.





OUTCOMES

After successful completion of the workshop, participants were able to:

- Understand the basic concepts of electronics, microcontrollers, and embedded systems.
- Identify different types of sensors and their applications in automation and smart devices.
- Demonstrate the working of Arduino-based circuits through hands-on practical activities.
- Develop problem-solving and analytical skills by assembling and testing simple electronic systems.
- Recognize the role of automation and sensor technologies in energy-efficient and intelligent systems.
- Develop interest in STEM education and explore future opportunities in engineering and technology.
- Strengthen collaboration between higher education institutions and school students through technical outreach programmes.

IMPACT

The workshop successfully promoted STEM education and created early awareness among school students regarding electronics, automation, and embedded technologies. The combination of theory, live demonstrations, and practical learning significantly enhanced student engagement and curiosity towards engineering concepts. The outreach initiative strengthened the relationship between R. C. Patel Institute of Technology and A. R. Patel School while showcasing the institute's commitment towards community engagement and knowledge dissemination. The active involvement of Energy Club student volunteers also contributed to the development of leadership, teamwork, and communication skills, thereby fostering a culture of innovation and technical excellence.



PO / PSO MAPPING

PO / PSO	Level	Justification
PO1	2	Applied fundamental engineering knowledge while explaining electronics and embedded systems.
PO2	2	Demonstrated analysis of simple electronic and sensor-based systems.
PO3	2	Showcased practical implementation of Arduino-based automation models.
PO9	3	Enhanced teamwork through collaborative demonstrations and student volunteer activities.
PO10	3	Improved communication and technical presentation skills during outreach sessions.
PO12	2	Encouraged lifelong learning and interest in emerging technologies.
PSO2	2	Introduced automation concepts using sensors and controller-based applications.
PSO3	3	Demonstrated Arduino, sensors, and intelligent automation systems through practical sessions.

SDG MAPPING

SDG	Description	Relevance
SDG 4	Quality Education	Promoted STEM education through interactive learning and hands-on practical sessions.
SDG 7	Affordable and Clean Energy	Introduced energy-efficient technologies using sensors and automation concepts.
SDG 9	Industry, Innovation and Infrastructure	Encouraged innovation through Arduino-based embedded system demonstrations.
SDG 11	Sustainable Cities and Communities	Demonstrated smart automation applications supporting sustainable living.

EVIDENCE





ACTIVITY HIGHLIGHTS

- One-day technical outreach workshop conducted at A. R. Patel School, Shirpur.
- Participation of 85 school students and 4 faculty members.
- Four expert sessions on electronics, microcontrollers, and sensor technologies.
- Hands-on Arduino demonstrations in the Atal Tinkering Laboratory.
- Interactive quiz conducted to reinforce learning.
- Active involvement of Energy Club student volunteers in coordination and technical demonstrations.
- Strengthened institute-school collaboration through STEM outreach.
- Promoted awareness of embedded systems, automation, and energy-efficient technologies among young learners.



ACTIVITY - 3

WORKSHOP REPORT

Event: Hands-on Workshop on Microcontrollers and Sensors

Venue: M.R. Patel Military School, Tande, Shirpur

Organized by: Energy Club, R. C. Patel Institute of Technology, Shirpur

Date: 14 October 2025

INTRODUCTION

The Energy Club of the Department of Electrical Engineering, R. C. Patel Institute of Technology, Shirpur, successfully organized a Hands-on Workshop on Microcontrollers and Sensors at M. R. Patel Military School, Tande, Shirpur.

The workshop aimed to introduce students to the fundamental concepts of microcontrollers and sensors—two crucial building blocks of modern electronic and IoT systems. The session provided students with both theoretical understanding and practical exposure, enabling them to connect classroom learning with real-world applications.

This outreach initiative was part of the Energy Club's mission to spread technical awareness and promote STEM learning among school students in nearby rural areas.

OBJECTIVES OF THE WORKSHOP

The primary objectives of the workshop were:

- To familiarize students with the basic architecture and operation of microcontrollers.
- To introduce various types of sensors and their role in automation and IoT systems.
- To demonstrate real-time applications of sensors and embedded systems.
- To encourage students' curiosity and innovation through interactive learning and practical exposure.
- To promote technical awareness at the school level through student-led outreach initiatives.



PLANNING

The Energy Club of the Department of Electrical Engineering planned a Hands-on Workshop on Microcontrollers and Sensors for students of M. R. Patel Military School, Tande, Shirpur as part of its technical outreach initiative. The organizing team coordinated with the school authorities to finalize the workshop schedule, participant arrangements, venue, and required infrastructure. Faculty mentors and student coordinators prepared presentation materials, Arduino boards, sensor modules, electronic components, and demonstration kits in advance. The workshop was structured to include technical sessions, an interactive quiz, and hands-on demonstrations, ensuring a balanced blend of theoretical concepts and practical learning.

EXECUTION

The workshop was conducted on 14 October 2025 at M. R. Patel Military School, Tande, Shirpur. The programme commenced with an inaugural session introducing students to the objectives of the workshop and the growing importance of embedded systems, IoT, and automation. Technical sessions covered the architecture and applications of microcontrollers, different types of sensors, and their real-world industrial applications. An interactive quiz was organized to reinforce learning and enhance student participation.

The workshop concluded with a hands-on practical session where students observed Arduino-based sensor interfacing, real-time data acquisition, LCD display, and automation models. Participants actively engaged in circuit demonstrations and programming activities, helping them relate theoretical concepts to practical engineering applications. The programme concluded with feedback collection and interaction with the participants.

OUTCOMES

After successful completion of the workshop, participants were able to:

- Understand the basic architecture and working principles of microcontrollers.
- Identify different types of sensors and their applications in embedded systems.
- Observe Arduino-based sensor interfacing and real-time automation techniques.
- Relate theoretical concepts with practical implementation through live demonstrations.
- Develop curiosity towards IoT, embedded systems, and emerging technologies.
- Enhance awareness of engineering education and STEM-based learning opportunities.



IMPACT

The workshop successfully created awareness about embedded systems, automation, and IoT among school students through an engaging blend of technical sessions and practical demonstrations. The activity strengthened technical outreach by promoting STEM education in rural schools while encouraging young learners to explore engineering and innovation. It also enhanced the leadership, communication, and organizational skills of the Energy Club student volunteers through active participation in planning and execution.

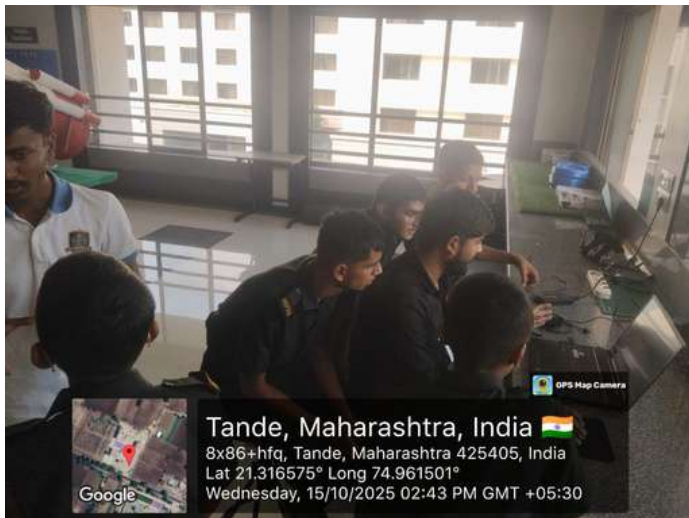
PO / PSO MAPPING

PO / PSO	Level	Justification
PO1	2	Applied engineering fundamentals while explaining embedded systems and sensors.
PO2	2	Demonstrated analysis of simple automation and sensor-based applications.
PO3	2	Showcased Arduino-based system design through practical demonstrations.
PO9	3	Promoted teamwork through collaborative workshop organization and demonstrations.
PO10	3	Enhanced communication and presentation skills during technical sessions.
PO12	2	Encouraged lifelong learning and interest in emerging technologies.
PSO2	2	Introduced controller-based automation concepts applicable to electrical systems.
PSO3	3	Demonstrated sensor interfacing, Arduino programming, and IoT-based applications.

SDG MAPPING

SDG	Description	Relevance
SDG 4	Quality Education	Promoted STEM education through interactive technical sessions and hands-on learning.
SDG 7	Affordable and Clean Energy	Demonstrated energy-efficient automation using sensors and embedded systems.
SDG 9	Industry, Innovation and Infrastructure	Encouraged innovation through Arduino-based embedded system demonstrations.
SDG 11	Sustainable Cities and Communities	Showcased smart automation technologies supporting sustainable infrastructure.

EVIDENCE





ACTIVITY HIGHLIGHTS

- Hands-on workshop conducted at M. R. Patel Military School, Tande, Shirpur.
- Technical sessions on microcontrollers, sensors, and IoT applications.
- Interactive quiz conducted to reinforce learning.
- Live Arduino-based demonstrations with sensor interfacing.
- Active participation of school students in practical activities.
- Successful technical outreach promoting STEM education in rural schools.
- Enhanced awareness of embedded systems, automation, and emerging technologies among young learners.



ACTIVITY - 4

EVENT REPORT

Event: EVision 2K26 – Innovative Electric Vehicle Design Competition

Venue: Electrical Engineering Department

Organized by: Energy Club, R. C. Patel Institute of Technology, Shirpur

Date: 16 February 2026

INTRODUCTION

Electric Vehicles (EVs) represent one of the most transformative technologies of the 21st century, offering a sustainable alternative to conventional fossil-fuel-based transportation. With growing environmental concerns and the global push towards clean energy, fostering EV innovation among future engineers has become imperative. In this context, the Energy Club of the Department of Electrical Engineering, under the aegis of the ISTE Students' Chapter at R.C. Patel Institute of Technology, Shirpur organized EVision 2K26: Innovative Electric Vehicle Design Competition on 16 February 2026. The event served as a platform for budding engineers to conceptualize, design, and present creative EV solutions that address real-world mobility challenges.

EVision 2K26 was envisioned as more than a competition; it was a celebration of innovation, sustainability, and interdisciplinary collaboration. By bringing together students from various engineering disciplines, the event created a vibrant ecosystem of ideas and technical engagement that reflects the institute's commitment to practical, forward-looking education.

OBJECTIVES OF THE WORKSHOP

The EVision 2K26 competition was designed with clear and purposeful objectives:

- To promote innovation and creative thinking in the domain of electric vehicle technology among engineering students.
- To encourage students to conceptualize and design EV solutions that address real-world mobility challenges, including agriculture, campus transportation, and accessibility for differently-abled individuals.
- To develop practical engineering skills through simulation-based design approaches and prototype conceptualization.
- To foster awareness about sustainable transportation and clean energy technologies among the student community.



- To nurture interdisciplinary collaboration by bringing together students from different engineering branches.
- To provide a competitive yet supportive platform that motivates students to pursue research and development in EV technology.
- To recognize and reward outstanding innovative ideas that demonstrate potential for prototype development and real-world application.

PLANNING

The Energy Club of the Department of Electrical Engineering, under the aegis of the ISTE Students' Chapter, planned EVision 2K26 – Innovative Electric Vehicle Design Competition to encourage students to develop innovative and sustainable mobility solutions. The organizing committee finalized the event schedule, competition guidelines, evaluation criteria, judging panel, and logistical arrangements in advance. Students from various engineering disciplines were invited to participate by presenting simulation-based EV designs addressing real-world challenges such as agricultural mobility, campus transportation, utility vehicles, and mobility solutions for differently-abled individuals. Expert faculty members and student coordinators were assigned to ensure smooth execution of the competition.

EXECUTION

The competition was conducted on 16 February 2026 in the Department of Electrical Engineering with enthusiastic participation from 18 teams comprising 79 students. The programme commenced with an inaugural session graced by the Director, Deputy Director, and Head of the Electrical Engineering Department, who highlighted the importance of innovation, sustainable engineering, and electric mobility.

Participating teams presented simulation-based EV design concepts before an expert panel of judges. The proposed solutions addressed diverse application areas including agricultural mobility, campus transportation, utility EVs, and accessible transportation for differently-abled individuals. The expert panel evaluated each design based on innovation, technical feasibility, sustainability, and practical applicability. The competition concluded with the announcement of winners, where two outstanding teams were awarded EV components worth ₹1,00,000 each to support prototype development and further innovation.

OUTCOMES

After successful completion of the competition, participants were able to:

- Apply engineering principles to design innovative electric vehicle solutions.
- Develop simulation-based design and technical presentation skills.
- Analyze real-world mobility challenges and propose sustainable engineering solutions.



- Enhance problem-solving, creativity, and innovation in electric vehicle technology.
- Strengthen teamwork and interdisciplinary collaboration through group participation.
- Develop awareness of clean energy technologies and sustainable transportation.
- Gain motivation towards research, prototype development, and entrepreneurship in the EV domain.

OUTCOMES

The competition successfully promoted innovation and sustainable engineering by encouraging students to develop practical electric vehicle solutions for societal needs. It provided a platform for interdisciplinary collaboration, technical learning, and creative problem-solving while strengthening students' confidence in presenting engineering ideas before experts. The event also motivated participants to pursue research, prototype development, and entrepreneurship in electric mobility, thereby reinforcing the institute's commitment to experiential learning and sustainable technological advancement.

PO / PSO MAPPING

PO / PSO	Level	Justification
PO1	3	Applied engineering fundamentals in EV system design.
PO2	3	Analyzed real-world mobility challenges and proposed solutions.
PO3	3	Designed innovative and simulation-based EV concepts.
PO5	2	Utilized modern engineering and simulation tools.
PO7	3	Promoted sustainable transportation and clean energy technologies.
PO9	3	Fostered teamwork through multidisciplinary team participation.
PO10	3	Enhanced technical presentation and communication skills.
PO12	2	Encouraged lifelong learning, innovation, and research.
PSO1	2	Promoted knowledge of EV power systems and sustainable energy applications.
PSO2	3	Applied electric drive concepts in innovative vehicle designs.
PSO3	2	Encouraged innovative EV technologies and intelligent mobility solutions.

SDG MAPPING

SDG	Description	Relevance
SDG 4	Quality Education	Promoted experiential learning through design-based competition.
SDG 7	Affordable and Clean Energy	Encouraged development of clean energy and electric mobility solutions.
SDG 9	Industry, Innovation and Infrastructure	Fostered innovation and prototype-based engineering design.
SDG 11	Sustainable Cities and Communities	Promoted sustainable transportation and smart mobility solutions.
SDG 13	Climate Action	Encouraged technologies that reduce carbon emissions through EV adoption.

EVIDENCE





ACTIVITY HIGHLIGHTS

- 18 teams comprising 79 students participated in the competition.
- Simulation-based innovative EV designs were presented across multiple application domains.
- Expert evaluation by faculty members and industry-oriented judging criteria.
- Winning teams received EV components worth ₹1,00,000 each for prototype development.
- Promoted innovation, sustainability, and interdisciplinary collaboration.
- Strengthened awareness of electric mobility and clean energy technologies.
- Encouraged research, entrepreneurship, and prototype development in the EV domain.



ACTIVITY - 5

WORKSHOP REPORT

Event: Hands-on Workshop on Arduino and Sensors

Venue: KVTR CBSE SCHOOL, Shirpur

Organized by: Energy Club, R. C. Patel Institute of Technology, Shirpur

Date: 26 February 2026

INTRODUCTION

In an era increasingly shaped by automation, smart devices, and interconnected systems, foundational knowledge of electronics and embedded technologies has become more relevant than ever. Recognizing the need to cultivate early interest in these areas, the Energy Club of R. C. Patel Institute of Technology (RCPIT), Shirpur, organized a Hands-on Workshop on Arduino and Sensors for the students of KVTR CBSE School, Shirpur.

This outreach initiative reflects the Energy Club's ongoing commitment to extending quality technical education beyond the college campus and into the wider community. By bringing students face-to-face with real components, live circuits, and working demonstrations, the workshop aimed to ignite curiosity and lay the groundwork for future exploration in science and engineering.

The event was conducted under the guidance of experienced faculty mentors and executed by dedicated student coordinators from the Energy Club, ensuring a balance of academic rigour and student-friendly delivery.

OBJECTIVES OF THE WORKSHOP

The workshop was designed with the following key objectives in mind:

- To introduce school students to the fundamental concepts of microcontrollers, sensors, and embedded systems.
- To demonstrate the practical applications of IoT and automation in everyday life and industry.
- To bridge the gap between theoretical science education and hands-on engineering practice.
- To provide students with direct exposure to Arduino programming and sensor interfacing.



- To inspire young learners to consider careers in technology, electronics, and engineering.
- To promote technical literacy and innovation-driven thinking at the school level.
- To strengthen ties between RCPIT and the local educational community through meaningful outreach.

PLANNING

The Energy Club of the Department of Electrical Engineering planned a Hands-on Workshop on Arduino and Sensors for the students of KVTR CBSE School, Shirpur as part of its technical outreach programme. The organizing committee coordinated with the school authorities to finalize the workshop schedule, venue, and participant arrangements. Faculty mentors and student coordinators prepared presentation materials, Arduino boards, sensor modules, electronic components, and demonstration kits in advance. The workshop was structured to include interactive technical sessions followed by live demonstrations and hands-on activities to provide an engaging learning experience.

EXECUTION

The workshop was conducted on 26 February 2026 at KVTR CBSE School, Shirpur. The programme commenced with an inaugural session introducing students to the importance of IoT, automation, and embedded systems. Technical sessions covered various types of sensors, their applications, Arduino architecture, programming fundamentals, and real-world automation systems. Participants were introduced to temperature, ultrasonic, IR, LDR, and motion sensors along with their practical applications.

The workshop concluded with a hands-on practical session where students observed Arduino-based projects, live sensor interfacing, real-time data acquisition, and LCD display of sensor outputs. Students actively participated in circuit demonstrations and programming activities, enhancing their understanding of embedded systems and IoT technologies. Feedback was collected at the end of the programme, reflecting enthusiastic participation and positive learning outcomes.

OUTCOMES

After successful completion of the workshop, participants were able to:

- Understand the fundamentals of Arduino, microcontrollers, and embedded systems.
- Identify different types of sensors and their real-world applications.
- Explain the basics of Arduino programming and sensor interfacing.
- Relate theoretical science concepts with practical engineering applications.
- Develop awareness of IoT, automation, and emerging technologies.
- Enhance curiosity and motivation towards engineering, robotics, and innovation.



IMPACT

The workshop successfully promoted STEM education by providing school students with practical exposure to Arduino programming, sensors, and IoT applications. The activity enhanced technical awareness, encouraged innovation, and inspired students to explore engineering and technology as future career options. It also strengthened the collaboration between RCPIT and the local educational community while providing Energy Club student volunteers with opportunities to develop leadership, communication, and organizational skills.

PO / PSO MAPPING

PO / PSO	Level	Justification
PO1	2	Applied engineering fundamentals while explaining Arduino and sensor technologies.
PO2	2	Demonstrated analysis of simple embedded and automation systems.
PO3	2	Showcased Arduino-based system design through practical demonstrations.
PO9	3	Promoted teamwork through collaborative workshop organization and demonstrations.
PO10	3	Enhanced communication and technical presentation skills.
PO12	2	Encouraged lifelong learning and interest in emerging technologies.
PSO2	2	Introduced controller-based automation concepts applicable to electrical systems.
PSO3	3	Demonstrated Arduino programming, sensor interfacing, and IoT applications.

SDG MAPPING

SDG	Description	Relevance
SDG 4	Quality Education	Promoted experiential learning through Arduino and sensor-based practical sessions.
SDG 7	Affordable and Clean Energy	Demonstrated energy-efficient automation using Arduino and sensors.
SDG 9	Industry, Innovation and Infrastructure	Encouraged innovation through embedded systems and IoT demonstrations.
SDG 11	Sustainable Cities and Communities	Showcased smart automation technologies supporting sustainable living.

EVIDENCE







ACTIVITY HIGHLIGHTS

- Hands-on workshop conducted at KVTR CBSE School, Shirpur.
- Technical sessions on Arduino, sensors, embedded systems, and IoT.
- Live demonstrations of Arduino programming and sensor interfacing.
- Practical exposure to real-time automation and embedded applications.
- Active participation and interaction from school students.
- Strengthened technical outreach and STEM education initiatives.
- Enhanced awareness of emerging technologies and engineering careers among young learners.



ANNUAL SUMMARY

The Energy Club of the Department of Electrical Engineering, R. C. Patel Institute of Technology, Shirpur, successfully organized a series of innovative technical and outreach activities during the academic year 2025–26, with the objective of promoting sustainable energy awareness, experiential learning, and technological innovation among students and the community. Through well-planned events, the club provided a platform for enhancing technical competencies, creativity, leadership, and social responsibility.

Throughout the academic year, the club organized five major activities, including a Poster Making Competition on Energy Sustainability and Green Innovations, Microcontroller and Sensors Workshops, Hands-on Workshops on Arduino and Sensors, and EVision 2K26 – Innovative Electric Vehicle Design Competition. These activities collectively engaged engineering students as well as school students, creating awareness about renewable energy, embedded systems, IoT, automation, electric vehicles, and sustainable engineering practices. The club also strengthened institute–school collaboration through technical outreach programmes, promoting STEM education among young learners.

The activities were designed following the principles of Outcome-Based Education (OBE) and significantly contributed to the attainment of Program Outcomes (POs) and Program Specific Outcomes (PSOs). Students enhanced their knowledge of electrical engineering fundamentals, developed practical skills through hands-on learning, improved teamwork, technical communication, innovation, and problem-solving abilities, while gaining exposure to emerging technologies such as Arduino, IoT, embedded systems, and electric mobility.

The initiatives were also aligned with the United Nations Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education), SDG 7 (Affordable and Clean Energy), SDG 9 (Industry, Innovation and Infrastructure), SDG 11 (Sustainable Cities and Communities), and SDG 13 (Climate Action), thereby reinforcing the institute's commitment to sustainable development and responsible engineering education.



The successful implementation of all activities was made possible through the dedicated efforts of the faculty coordinators, Energy Club office bearers, student volunteers, and enthusiastic participants. The active involvement of students in planning, organizing, and executing these events fostered leadership qualities, organizational skills, and a spirit of teamwork. The club also received an encouraging response from participants, reflecting the effectiveness and impact of its initiatives.

Overall, the Energy Club has established itself as a vibrant platform for innovation, technical excellence, and community engagement. The activities conducted during the academic year 2025–26 have significantly contributed to enriching students' academic experience while promoting sustainable technologies and lifelong learning. Building on this success, the club aims to organize more industry-oriented workshops, innovation competitions, research activities, industrial interactions, and community outreach programmes in the coming years to further strengthen technical education and societal impact.