NANDHA ENGINEERING COLLEGE, (AUTONOMOUS) – ERODE-52
DEPARTMENT OF FRESHMEN ENGINEERING
DEPARTMENT OF PHYSICS
One day hands on training on –
"Build Your Own Solar Cell: Immersive Fabrication Workshop"

Activity	Build Your Own Solar Cell: Immersive Fabrication Workshop
Target People	B.E (Computer Science and Engineering)- I Year
Date	November 04, 2025
Venue	Conference Hall and Physics Lab
Organized by	Quantum Crew (Physics Association)
Prepared by	Physics Team
SDG Alignments	SDG 4 – Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
	SDG 7 – Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy for all
	SDG 9 – Industry, Innovation and Infrastructure Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
	SDG 11 – Sustainable cities and communities Make cities and human settlements inclusive, safe, resilient and sustainable

Event Report

Objective of Event

Hands-on training in solar cell fabrication for students involves practical exposure to the entire process of making solar cells (PN junction) and modules — from raw materials to mini panels. It helps to bridge the gap between classroom theory and real-world renewable energy applications.

Event Details

Date	Time	Venue	Session	Session Learners
04.11.25	11.00 AM to 12.45 PM	Conference Hall	Guest Lecturer in Solar cell fabrication	200 students
04.11.25	2.00 PM to 4.00 PM	Physics Lab	Solar Cell fabrication	60 students

A total of 200 participants actively took part in the guest lecture event, and 60 students were selected for the hands-on training workshop from the Computer Cluster Department based on their performance. The majority of the learners were from the Computer Science (CSE) department, along with students from AIDS, CSE (IoT), CSE (CS), and IT. First-year undergraduate students showed keen interest and enthusiasm throughout the session. The participants engaged actively in discussions and interacted with the resource person, gaining valuable insights into the topic. Feedback collected from the learners indicated that the event significantly enhanced their conceptual understanding and provided practical exposure relevant to their curriculum.

Resource Person Details

Name: Dr. B. Janarthanan
Designation: Professor & Head
Department: Department of Physics
Institution/Organization: Karpagam Academy of Higher Education, Coimbatore
Contact Information: janarthanan.b@kahedu.edu.in
Area of Expertise: Fabrication of dye sensitized and perovskite cells solar cell

Brief Profile:

Dr. B. Janarthanan has over 20 years of teaching and research experience in renewable energy materials and nanotechnology. He has published more than 20 research papers in reputed international journals and has guided several Ph.D. scholars. He is a recognized expert in sustainable energy technologies and has delivered numerous invited talks across Tamil Nadu.

Intended Outcomes

- Understand the basic principles and working mechanism of solar cells.
- Gain hands-on experience in the fabrication process of photovoltaic devices.
- Learn about the materials, equipment, and techniques used in solar cell preparation.
- Identify and analyze the key parameters affecting solar cell efficiency.
- Correlate theoretical concepts with practical fabrication steps.
- Enhance learners' technical competence in renewable energy systems.
- Promote awareness of sustainable and clean energy technologies.
- Encourage innovation and research interest in solar energy applications.

SDG Alignment

SDG 4: Quality Education - By providing hands-on training and practical exposure to renewable energy technologies, the event enhances students' technical knowledge and problem-solving abilities.

SDG 7: Affordable and Clean Energy - Through this initiative, participants gain knowledge and motivation to develop cost-effective and efficient solar energy systems, supporting the transition toward a greener future.

SDG 9: Industry, Innovation, and Infrastructure - The hands-on training encourages participants to apply innovative methods for improving energy efficiency and developing sustainable energy materials. The events help bridge the gap between academic learning and industrial application, preparing students for future roles in green technology and clean energy industries.

SDG 11: Sustainable Cities and Communities - By promoting the use of solar energy for sustainable urban development. It builds awareness of renewable technologies, encourages eco-friendly practices, and prepares learners to contribute to greener and more resilient communities.

About Session

Morning Session

The Department of Physics organized a Guest Lecture on "Fabrication of Dye-Sensitized Solar Cells (DSSCs)", delivered by Dr. B. Janarthanan on 4th November 2025. The session aimed to provide students with both theoretical knowledge and practical insights into the emerging field of dye-sensitized solar cell technology. Dr. B. Janarthanan

began the lecture with an introduction to photovoltaic principles and the transition from traditional silicon-based solar cells to dye-sensitized systems, highlighting their cost-effectiveness, environmental benefits, and versatility. He explained the working mechanism of DSSCs, focusing on the functions of the photo anode (TiO_2 film), sensitizing dye, electrolyte, and counter electrode. The session covered key fabrication steps, including substrate cleaning, TiO_2 coating, sintering, dye sensitization, and device assembly.

Afternoon Session

The session began with a brief theoretical introduction to solar energy conversion principles and the working mechanism of DSSCs, emphasizing their role as a cost-effective

and eco-friendly alternative to traditional silicon solar cells. Dr. Kumar explained the structural components of a DSSC, including the photoanode (TiO_2 film), dye sensitizer, electrolyte, and counter electrode, followed by a demonstration of each fabrication step — such as substrate cleaning, TiO_2 coating, sintering, dye adsorption, and cell assembly. Participants actively engaged in the fabrication process, gaining hands-on experience in preparing and assembling the device. They also performed basic performance testing and learned about characterization techniques used to analyze cell efficiency. The session emphasized the importance of material optimization, sustainability, and innovation in solar cell research.

Students Feedback

S. Kanithra (732225CS077) - This workshop was a turning point in how I perceive renewable energy. The hands-on fabrication of a solar cell helped me understand the physics behind photovoltaic technology in a way textbooks never could.

R. Janarthanan (732225CC018) -Session was both enlightening and motivating. His passion for research was contagious, and his quote—'The learner can feel that the research is remarkable and amazing'—truly resonated with us.

Conclusion

The Immersive Fabrication Workshop on Solar Cell Building successfully achieved its objective of bridging theory with practice, empowering students to explore renewable energy technologies in a hands-on manner. Under the expert guidance of Dr. B. Janarthanan, participants not only learned the scientific principles behind solar cell fabrication but also experienced the excitement of innovation and research.

The program fostered:

- Practical skill development through laboratory engagement
- Inspiration for research and higher studies in sustainable energy
- Awareness of global responsibility, aligning with Sustainable Development Goals such as Quality Education, Affordable and Clean Energy, and Climate Action
- Collaborative learning, supported by the dedicated faculty coordinators and conveners

Students left the workshop with a renewed sense of curiosity, confidence, and motivation to contribute to the field of clean energy. The event stands as a testament to Nandha Engineering College's commitment to nurturing innovation, sustainability, and academic excellence.

NANDHA
Engineering College (Autonomous)

(Affiliated to Anna University, Chennai, Approved by AICTE, New Delhi,
Accredited by NAAC with A+ Grade)
Erode - 638 052, Tamil Nadu.

INSTITUTION'S INNOVATION COUNCIL

NEC RISING HIGHER EVERYDAY

Institution's Innovation Council & Department of Physics

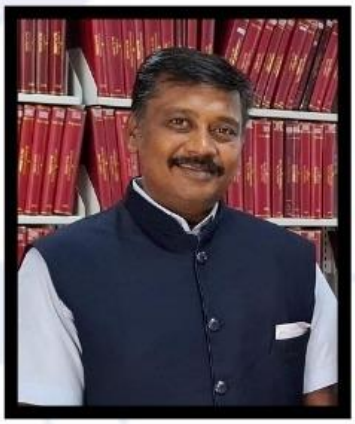
Jointly Organize

One Day Hands on Training Workshop on

"BUILD YOUR OWN SOLAR CELL: IMMERSIVE FABRICATION WORKSHOP"

4 QUALITY EDUCATION

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



7 AFFORDABLE AND CLEAN ENERGY

11 SUSTAINABLE CITIES AND COMMUNITIES

NOV 04 2025

GUEST SPEAKER
Dr. B. JANARTHANAN
Professor & Head
Karpagam Academy of Higher Education, Coimbatore.

11.00AM to 4.30PM

Venue: NEC, Conference Hall & Physics Laboratory

"The pleasure in physics is that the revealed truth is remarkable and amazing"

Coordinators	Convenors	Principal
Dr. V. Thayanithi AP/Physics	Mr. R. ThiruneelaKkandan Head/FED	Dr. U. S. Ragupathy
Dr. K. Ajith Kumar AP/Physics	Dr. T. Jayanalina Prof & Head/Physics	