



# 5 DAY WORKSHOP REPORT

*In the title of*

**“Exploring Electrical Engineering Trends: Connecting  
Minds and Machines for the Future”**

**(Virtual Mode)**

**10<sup>th</sup> to 14<sup>th</sup> Jan 2023**



**Jointly Organized by**

**Project Club &**

**Department of Electrical and Electronics Engineering**

**KINGS COLLEGE OF ENGINEERING, PUNALKULAM**

**A NAAC Accredited Institution**

**Recognized under 2(f) & 12(B) of UGC**

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## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ACADEMIC YEAR (2022-2023) ODD SEM

### REPORT ON FIVE DAY WORKSHOP PROGRAMME

**Title of the FDP** : 5-Day workshop on “Exploring Electrical Engineering Trends: Connecting Minds and Machines for the Future”

**Date** : 10.01.2023 to 14.01.2023

**Resource Persons** :

1. Dr.C.Balasundar, Thiagarajar College of Engineering, Madurai.
2. Dr. M. Bharathidasan, Senior Engineer, Axiscades Technologies, Bangalore.
3. Dr. N. Muthukumar, System Analyst, Ramco Systems Pvt Ltd, Chennai.
4. Dr. M. Vijayakumar, Director, Interlogic Technologies, Thanjavur.
5. Dr. P. Krishnamoorthy, Assistant Professor/ HOD, EEE, GCE, Thanjavur.

**No of students participate** : 9

#### **Objectives of workshop:**

- Understand current electrical engineering trends, including Industry 4.0, sustainable energy, IoT, automation, and AI.
- Develop practical skills in simulation software, design renewable energy systems, and build IoT devices.
- Apply theoretical concepts by designing renewable energy systems and implementing AI algorithms.
- Gain career insights through a panel discussion with industry experts, preparing for future opportunities.

## DAY: 1 (10.01.2023)

Resource Person: **Dr.C.Balasundar, Thiagarajar College of Engineering, Madurai.**

Title: **Foundations of Electrical Engineering Trends**

### Session (FN):

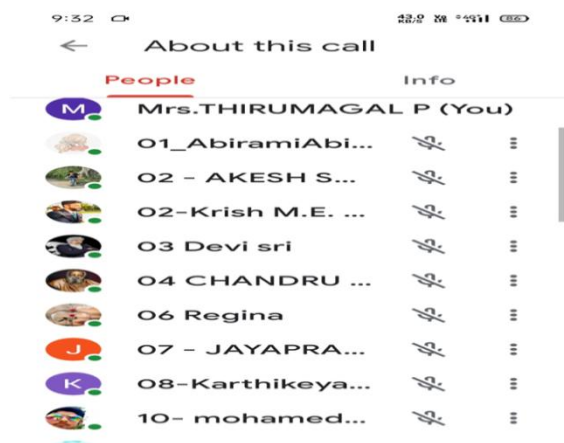
#### Emerging Trends and Basics of Industry 4.0

- Investigated the then-current landscape and recent innovations in electrical engineering.
- Discussed emerging trends, including smart grids, renewable energy integration, and applications of artificial intelligence.
- Introduced the fundamentals of Industry 4.0 and its transformative impact on traditional manufacturing and electrical systems.
- Examined technologies associated with Industry 4.0, such as the Internet of Things (IoT), cyber-physical systems, and data analytics, highlighting their relevance to electrical engineering.

### Session (AN):

#### Hands-On Session: Simulation Software Introduction

Students utilized industry-standard tools like MATLAB/Simulink, LTspice, and PSpice. They simulated circuits, gaining practical insights and applying theory. Activities included designing circuits, testing responses, and troubleshooting. An overview emphasized key software features, showcasing its relevance in real-world engineering applications. The hands-on experience allowed students to explore the software's practical applications in analyzing and designing circuits within a controlled virtual environment.



## **DAY: 2 (11.01.2023)**

Resource Person: **Dr. M. Bharathidasan, Senior Engineer, Axiscades Technologies, Bangalore.**

Title: **Sustainable Energy Solutions**

### **Session (FN):**

#### **Renewable Energy Technologies**

- Explored solar, wind, and various renewable energy sources.
- Discussed the key characteristics and applications of different renewable technologies.
- Highlighted the importance of sustainable energy in the context of modern electrical systems.

#### **Smart Grids and Energy Storage**

- Examined smart grid technologies and their role in enhancing electrical infrastructure.
- Explored advancements in energy storage, including batteries and other innovative solutions.
- Discussed the impact of smart grids and energy storage on the efficiency and reliability of power systems.

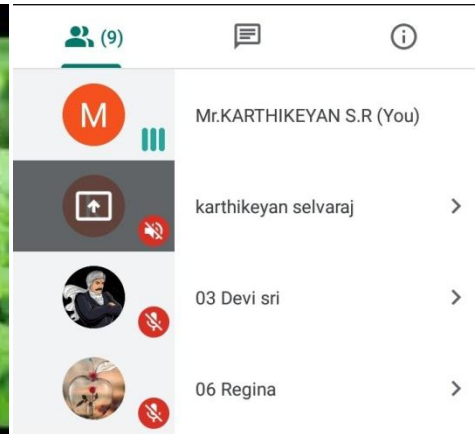
#### **Case Studies and Best Practices**

- Presented real-world examples showcasing successful implementations of sustainable energy solutions.
- Analyzed case studies to understand the challenges and solutions in renewable energy projects.
- Discussed best practices for achieving optimal performance and sustainability in energy initiatives.

### **Session (AN):**

#### **Hands-On Session: Designing a Miniature Renewable Energy System**

During this interactive session, students leveraged specialized simulation software such as HOMER Pro and RETScreen to practically apply their knowledge in designing a miniature renewable energy system. Using these tools, students gained hands-on experience in the virtual creation of sustainable energy solutions. The exercise involved selecting appropriate renewable sources, sizing components, and optimizing the system for efficiency and reliability. This practical application provided students with valuable insights into the complexities of designing real-world renewable energy systems, bridging the gap between theory and practical implementation. Through the use of simulation software, students honed their skills in making informed decisions and gained a deeper understanding of the intricacies involved in sustainable energy design.



### **DAY: 3 (12.01.2023)**

Resource Person: **Dr. N. Muthukumar, System Analyst, Ramco Systems Pvt Ltd, Chennai.**

Title: **IoT and Automation in Electrical Systems**

#### **Session (FN):**

##### **Internet of Things (IoT) in Electrical Engineering**

- Explored the pivotal role of IoT in electrical systems.
- Discussed applications and implications of IoT in modern electrical engineering practices.
- Examined how IoT contributes to the evolution of interconnected electrical networks.

##### **Automation and Control Systems**

- Provided an overview of automation technologies relevant to electrical engineering.
- Explored applications of automation and control systems in diverse electrical scenarios.
- Discussed the integration of automated processes to enhance efficiency and reliability.

##### **Virtual Lab Demonstration**

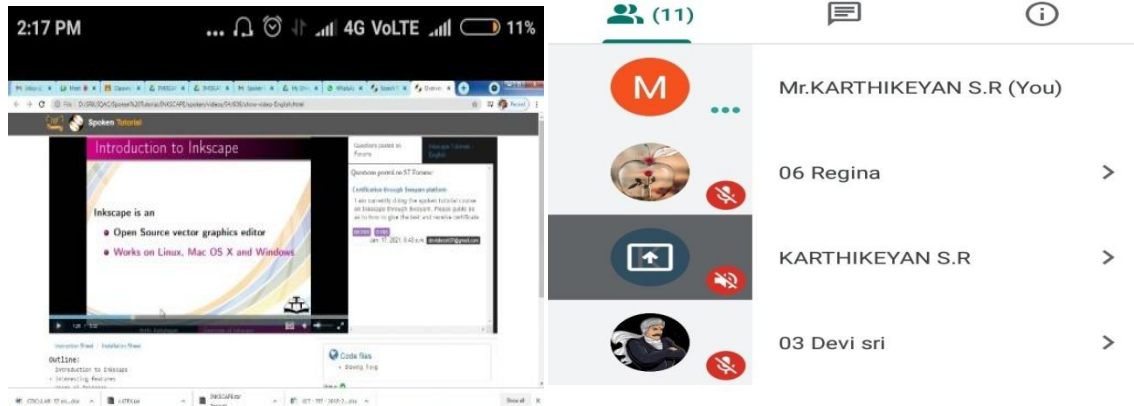
- Facilitated a virtual hands-on experience, allowing students to interact with simulated IoT devices.
- Explored practical applications of IoT in a controlled and interactive virtual environment.
- Gave students a tangible understanding of IoT device functionalities.

#### **Session (AN):**

##### **Hands-On Session: Building and Programming IoT Devices**

In this interactive workshop, students delved into the realm of Internet of Things (IoT) by engaging in the hands-on creation and programming of Arduino-based IoT devices. Using Arduino microcontrollers and sensors, students had the opportunity to construct practical IoT solutions. The session covered the fundamental aspects of building and programming, including connecting sensors, implementing data

acquisition, and programming device functionalities. Through this practical exercise, students gained firsthand experience in the design and implementation of IoT devices, fostering a comprehensive understanding of the hardware and software aspects of IoT technology. The use of Arduino offered a user-friendly platform, enabling students to explore the endless possibilities of IoT applications and enhancing their skills in hardware integration and programming within the context of electrical engineering.



#### **DAY: 4 (13.01.2023)**

Resource Person: **Dr. M. Vijayakumar, Director, Interlogic Technologies, Thanjavur.**

Title: **Artificial Intelligence in Electrical Engineering**

#### **Session (FN):**

##### **Introduction to AI in EEE**

- Covered the basics of artificial intelligence and machine learning within the context of electrical engineering.
- Introduced fundamental concepts, algorithms, and applications of AI in various electrical systems.

##### **AI Applications in Power Systems**

- Explored real-world case studies showcasing how AI is revolutionizing power systems.
- Analyzed the impact of AI on improving efficiency, reliability, and sustainability in power distribution and management.

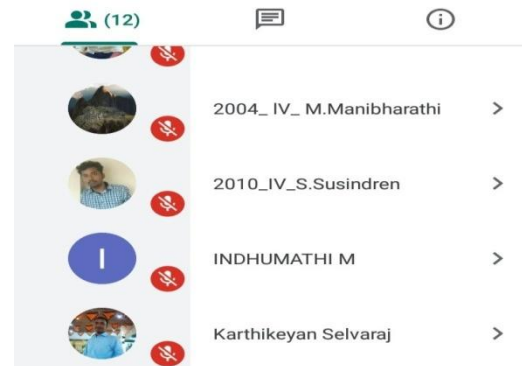
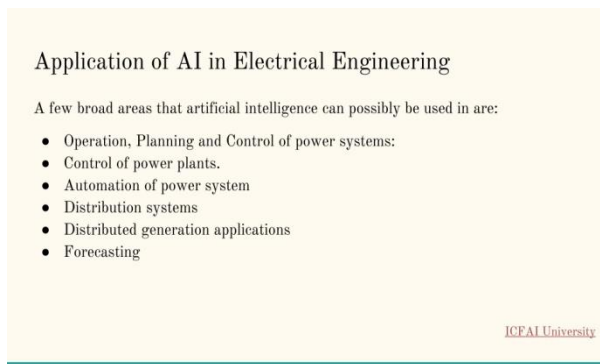
##### **Interactive Workshop on AI Integration**

- Facilitated a collaborative workshop where students explored practical applications of AI in electrical engineering.
- Encouraged hands-on engagement and discussions on potential implementations and challenges.

## **Session (AN):**

### **Hands-On Session: Implementing AI Algorithms in Electrical Systems**

In this practical session, students dived into the integration of artificial intelligence (AI) in electrical systems using Python programming language and popular AI libraries such as TensorFlow. The focus was on implementing basic AI algorithms, such as machine learning classifiers, within simulated electrical systems. Students gained hands-on experience in coding and deploying algorithms, fostering a deeper understanding of how AI can enhance decision-making processes and optimize performance in electrical engineering applications. Through this exercise, the students explored the practical aspects of AI integration in a controlled environment, laying the groundwork for their future applications in real-world electrical systems.



## **DAY: 5 (14.01.2023)**

Resource Person: **Dr. P. Krishnamoorthy, Assistant Professor/ HOD, EEE, GCE, Thanjavur.**

Title: **Future Perspectives and Career Guidance**

## **Session (FN):**

### **Future Trends and Emerging Technologies**

- Engaged in a discussion on anticipated developments in the field of electrical engineering.
- Explored emerging technologies and their potential impact on the future landscape of electrical systems.

### **Panel Discussion: Navigating Careers in EEE**

- Received valuable insights from industry experts and professionals during a dynamic panel discussion.
- Students had the opportunity for Q&A, gaining practical advice for navigating and succeeding in electrical engineering careers.

### New Transmission Technologies

- **High Voltage Overhead Transmission**
  - Voltage up to 1100 kV
  - High EM radiation and noise
  - High corona loss
  - More ROW clearance
- **Gas Insulated Cables/Transmission lines**
- **HVDC-Light**
- **Flexible AC Transmission Systems (FACTS)**

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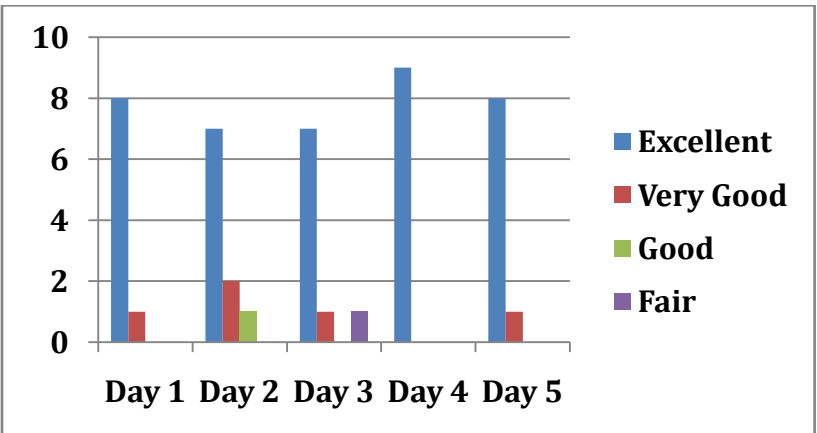
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**OUTCOME:**

- Students acquired a comprehensive understanding of current trends, technologies, and applications in electrical engineering.
- Hands-on sessions using industry-standard tools and software, including MATLAB/Simulink, LTSpice, PSpice, HOMER Pro, RETScreen, and Python with TensorFlow, enhanced practical skills in designing, programming, and implementing electrical systems.
- Exposure to real-world applications through case studies and interactive workshops allowed students to connect theoretical concepts to practical scenarios.
- Collaborative learning environments, interactive workshops, and panel discussions provided opportunities for students to engage, share ideas, and learn from industry experts and peers.
- The workshop's focus on future trends, emerging technologies, and a panel discussion on navigating careers in electrical engineering offered valuable insights, contributing to students' professional development.
- Overall, the workshop successfully bridged the gap between theoretical knowledge and practical application, equipping students with both knowledge and skills for the dynamic and evolving landscape of electrical engineering.

**FEEDBACK:**





**Feedback - 5 Days workshop on "Exploring Electrical Engineering Trends: Connecting Minds and Machines for the Future**

10.01.2023 to 14.01.2023

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*S. R. K. Sathya*  
20/01/23  
**Coordinator** 20/01/23

*A. M. M. M.*  
20/01/23  
**HOD/EEE**

*J. R. R. R.*  
20/1/2023  
**PRINCIPAL**