REPORT

Conveners

Dr. A. Dominic Savio
Assistant Professor/EEE, SRMIST
Dr. C. Balaji
Assistant Professor /EEE, SRMIST
Dr. R. Narayanamoorthi,
Associate Professor/EEE, SRMIST

Contents

1. Information Brochure

TOPICS COVERED

Session 1: Introduction to Controller Programming
Session 2: Solar Panel Monitoring and Control
Session 3: Electric Vehicle (EV) Controller Programming
Session 4: Hands-On Practice on Solar Street Light System Development
Session 5: Advanced Applications and Integration

TARGET AUDIENCE

B.Tech and M.Tech Students, Research Scholars, Faculties, Industry professionals.

REGISTRATION DETAILS

Registration Fee (SRMIST)	: INR 100
Registration Fee (Others)	: INR 200
Last date for Registration	: 21-01-2025
Intimation of Confirmation	: 21-01-2025

Payment Gpay No: 98405 19852 Dominic

REGISTRATION LINK

Register through the registration link
https://forms.gle/3ZSxSKaNwjuc4af49

CONTACT

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Chief Patrons

Dr.T.R.Paarivendhar
Founder & Chancellor ,SRM IST
Dr.Ravi Pachamoothoo
Pro-Chancellor Administration ,SRM IST
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Dr. Vijayakumar K
Dean, School of Electrical and Electronics
SRM IST - KTR
Dr. Sridhar R
HoD, Dept of Electrical and Electronics Engineering
SRM IST - KTR

Conveners

Dr. A. Dominic Savio, Assistant Professor, EEE
Dr. C. Balaji, Assistant Professor, EEE
Dr. R. Narayanamoorthi, Associate Professor, EEE

Coordinators

Dr. Poornima P U, Assistant Professor, EEE
Dr. R.Ramya, Assistant Professor, EEE
Dr. A.Sureshkumar, Assistant Professor, EEE

SRM INSTITUTE OF SCIENCE & TECHNOLOGY
INSTITUTION'S INNOVATION COUNCIL

E-DRIVE myequation

Hands-on Training on Controller Programming for Renewable Energy Applications

22nd January 2025.

Organized by

Department of Electrical and Electronics Engineering
College of Engineering and Technology
SRM Institute of Science and Technology
Kattankulathur - 603203

ABOUT SRMIST

SRM Institute of Science and Technology (formerly known as SRM University) is one of the top-ranking universities and most premier engineering destinations in India. It was established in 1985 by the Founder Chancellor Dr. T.R. Paarivendhar. It is operational with over 70,000 students and more than 3200 faculty members across all campuses: Kattankulathur, Ramapuram, Vadapalani, Tiruchirappalli (TN), Modinagar (UP), Sonepat (Haryana), Amaravati (AP) and Gangtok (Sikkim). The UGC and MoE, Department of Higher Education, Government of India, granted a graded autonomy status to SRMIST by classifying it as a category-1 University. SRMIST has also been recently accredited with the highest grade of A++ by the NAAC. SRMIST is also globally ranked among top 41 Indian Universities by QS (Quacquarelli Symonds). The National Institutional Ranking Framework ranks SRMIST 12th in the engineering category and is positioned 13th in the

ABOUT THE DEPARTMENT

The Department of Electrical and Electronics Engineering came into existence in the academic year 1992-1993 as one of the core Engineering branches and key entities of SRM Engineering College under the affiliation of the University of Madras. Since then, there has been consistent development in all spheres including infrastructure facilities, staff development and student development. The programmes offered by the department under the University of Madras were brought under the ambit of Anna University from the academic year 2001 to 2002. The department has started functioning under SRM Institute of Science and Technology (Deemed University) from the academic year 2003 to 2004.

The department now offers B. Tech. (Electrical and Electronics Engineering), B. Tech. (Electrical and Computer Engineering), M. Tech. – Power Electronics and Drives, M. Tech. – Power Systems and PhD programme under the College of Engineering and Technology, SRMIST. The B.Tech. in Electrical and Electronics Engineering programme at Kattankulathur Campus is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org and the National Board of Accreditation (NBA). The department has over 54 faculty members in the diverse fields of Electrical Engineering. The department is also recognized with AICTE-CII Award for Best Industry Linked Institute for Electrical Engineering and Allied category, for the academic year 2019-2020. The department is ranked 10th in India, 2nd position in private and

ABOUT THE WORKSHOP

The Hands-on Training on Controller Programming for Renewable Energy Applications is designed to provide participants with a comprehensive blend of theoretical knowledge and practical skills in programming controllers for diverse renewable energy applications. This immersive workshop emphasizes mastering techniques to design, implement, and optimize systems tailored to the unique needs of renewable energy technologies. By balancing foundational concepts with real-world implementation, participants will gain a robust understanding of controller programming while exploring the broader implications of integrating these systems into sustainable energy solutions. Sponsored by My Equation Education and IEI, the training fosters a dynamic learning environment aimed at advancing skills critical for the future of renewable energy innovation.

OBJECTIVES OF THE WORKSHOP

1. To Equip participants with the skills to program and configure controllers for various applications, including renewable energy and electric vehicles.
2. To Provide in-depth knowledge of solar panel monitoring, control strategies, and Electric Vehicle (EV) controller programming, emphasizing real-world applications and challenges.
3. To offer practical experience through the development and implementation of a solar-powered street light system, fostering an understanding of advanced applications and seamless system integration.

2. Program Schedule

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING, Kattankulathur

Hands-on Training on Controller Programming for Renewable Energy Applications

Date: 22 Jan 2025

Program Schedule

22 Jan 2025		
Time	**Topic**	**Resource Person**
9:30 am to 9:45 am	Inauguration	Dr. Preetha Roselyn J, Professor Department of Electrical and Electronics Engineering
9:46 am to 10:00 am	**Tea Break**	
10:00 am to 11:30 pm	Introduction to Different Controller Programming renewable energy Application	R Premkumar, Associate Professor, EEE Sri Sai Ram Engineering College
11:30 am to 1:00 pm	Hands on training on controllers and controller programming	R Premkumar, Associate Professor, EEE Sri Sai Ram Engineering College
	Lunch Break	
1:45 pm to 2:45 pm	Solar Street Light System Development	Dr. R.Zahira, Associate Professor, BSA Crescent Institute of Science and Technology
	Tea Break	
3:00 pm to 5:00 pm	Solar Panel Monitoring and Control and Its programming	Dr. R.Zahira, Associate Professor, BSA Crescent Institute of Science and Technology
5:00 pm to 6:00pm	Hands on training on Battery management System, and BMS Programming and Battery testing controller, Lab visit and Demo	Dr. A. Dominic Savio Assistant Professor/EEE, SRMIST Dr. C. Balaji Assistant Professor /EEE, SRMIST

3. Program summary

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING, Kattankulathur

Hands-on Training on Controller Programming for Renewable Energy Applications

Hands-on Training on Controller Programming for Renewable Energy Applications

Inauguration

- Dr. Preetha Roselyn J, Professor, Department of Electrical and Electronics Engineering

The event will commence with an inaugural session led by Dr. Preetha Roselyn J, where she will introduce the objectives of the workshop, highlight its significance in the field of renewable energy, and outline how controller programming plays a crucial role in sustainable energy solutions. The session will also provide an opportunity to acknowledge the contributions of experts and sponsors involved in the training program.

Introduction to Different Controller Programming for Renewable Energy Applications

Resource Person: Mr. R Premkumar, Associate Professor, EEE, Sri Sai Ram Engineering College

This session will introduce participants to various controllers used in renewable energy systems, with a focus on their programming methodologies. Key topics include:

1. Types of Controllers Used in Renewable Energy
    - Microcontrollers (Arduino, ESP32, STM32)
    - Programmable Logic Controllers (PLCs)
    - Digital Signal Processors (DSPs)
    - Field-Programmable Gate Arrays (FPGAs)
2. Programming Approaches
    - Embedded C and Python-based programming for microcontrollers
    - Ladder logic and structured text for PLCs
    - MATLAB/Simulink-based control strategies

Hands-on Training on Controllers and Controller Programming

Resource Person: Mr. R Premkumar, Associate Professor, EEE, Sri Sai Ram Engineering College

This hands-on session will allow participants to apply their learning by working directly with controllers. Activities will include:

1. Introduction to Controller Boards

- Setting up microcontrollers like Arduino, STM32, and ESP32
- Connecting controllers with sensors and actuators

2. Simulation & Testing
    - Running control algorithms on simulation platforms (Proteus, MATLAB Simulink)
    - Testing real-time responses with hardware setups

By the end of this session, participants will have a working knowledge of how to program controllers for renewable energy applications.

Lunch Break

Solar Street Light System Development

Resource Person: Dr. R. Zahira, Associate Professor, BSA Crescent Institute of Science and Technology

This session will focus on the development of solar-powered street lighting systems. Key discussion points include:

1. Design of a Solar Street Light System
    - Selection of solar panels, batteries, and LED drivers
    - Load calculation and system sizing
    - Integration of charge controllers
2. Controller Programming for Solar Street Lights
    - Automatic dusk-to-dawn operation using light sensors
    - Battery charging and discharging control algorithms
    - PWM-based LED dimming control for energy efficiency

Solar Panel Monitoring and Control and Its Programming

Resource Person: Dr. R. Zahira, Associate Professor, BSA Crescent Institute of Science and Technology

This session will cover the monitoring and control mechanisms of solar power systems, emphasizing real-time performance optimization. Key topics include:

1. Solar Panel Monitoring Techniques
    - Measuring voltage, current, and power output
    - Environmental parameter monitoring (temperature, irradiance)
    - Real-time data logging using IoT-based solutions
2. Programming Controllers for Solar Panel Control
    - Implementing MPPT (Maximum Power Point Tracking) algorithms
    - DC-DC converter control for optimal power transfer

- Wireless monitoring and remote control through mobile apps and cloud platforms

Hands-on Training on Battery Management System (BMS), BMS Programming, and Battery Testing Controller

- Dr. Dominic Savio and Dr. C. Balaji, Assistant Professor, Department of Electrical and Electronics Engineering

This hands-on session will focus on battery management systems (BMS) and their programming, which is crucial for electric vehicles and renewable energy storage systems.

1. Introduction to Battery Management Systems (BMS)
    - Importance of BMS in lithium-ion battery packs
    - Key functions: State of Charge (SOC) & State of Health (SOH) estimation
    - Battery safety features: Overcharge, deep discharge, and thermal protection
2. Programming for BMS Control
    - Writing control algorithms for battery charge/discharge management
    - Implementing cell balancing techniques
    - Integrating temperature and current sensors with BMS
3. Battery Testing Controllers
    - Hands-on experience with battery testing equipment
    - Measuring battery efficiency and performance parameters
    - Real-time BMS data logging and analysis

workshop provides a comprehensive introduction to controller programming in renewable energy applications. The combination of theory, hands-on sessions, and real-world applications ensures that participants gain valuable knowledge and practical experience.

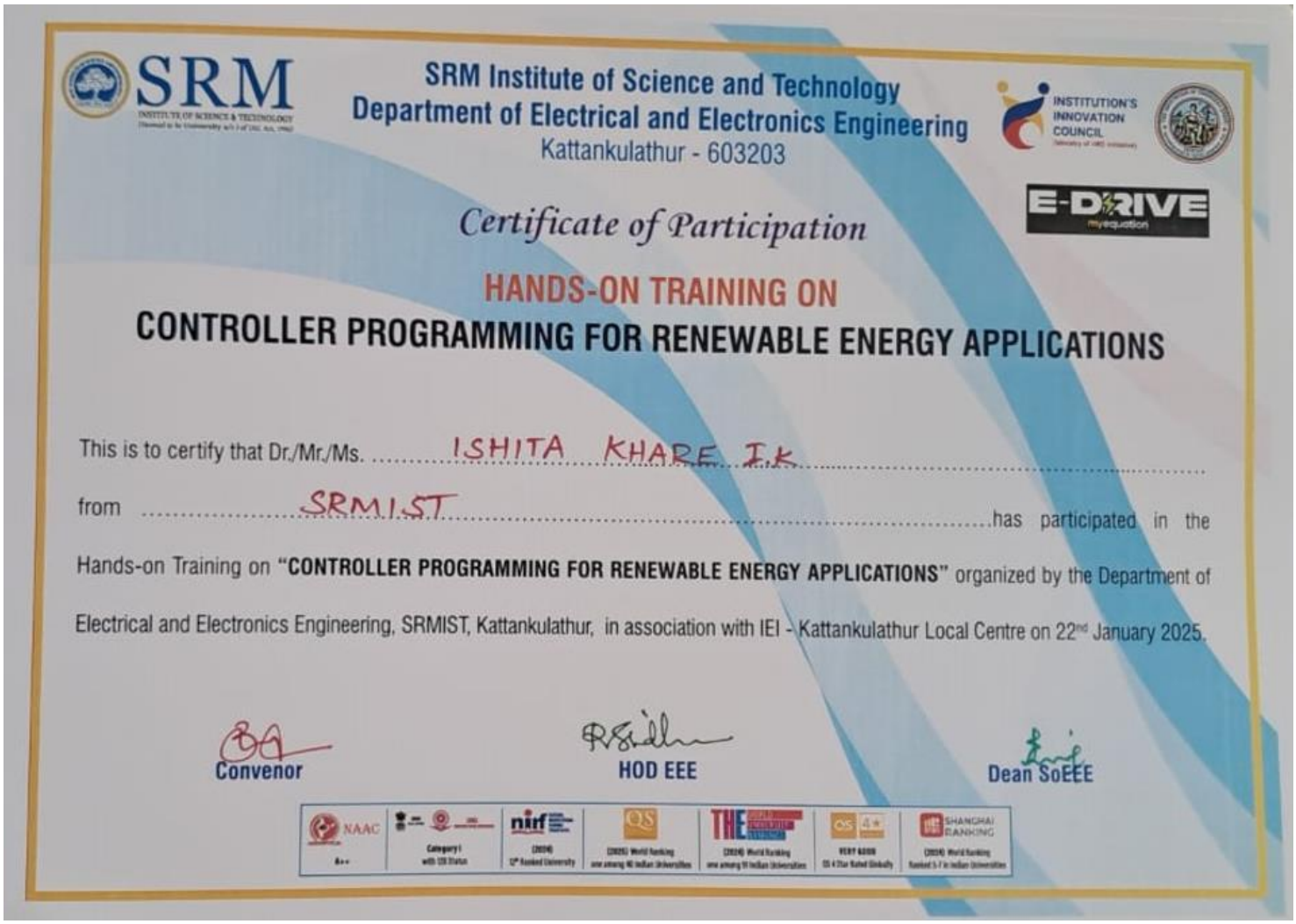
Additionally, MyEquation Skill Tech, a startup specializing in skill development and technology training, will deliver an online presentation and has generously provided a sponsorship of ₹10,000 to support the event.

Participants List

Sl No	Title	Name (Followed by initial)	Institution / Organisation Name
1	Ms.	S SOWNDHARYA	A K T memorial college of engineering and technology
2	Mr.	GOWTHAM.V	ANNAI MIRA COLLEGE OF ENGINEERING AND TECHNOLOGY
3	Mr.	HARSATH.S	ANNAI MIRA COLLEGE OF ENGINEERING AND TECHNOLOGY
4	Mr.	Mir Ehtisham Pervaiz	SRMIST
5	Mr.	Mohammed Abdalla Ali Ahmed	SRMIST
6	Mr.	Pranavraj V	SRMIST
7	Ms.	Sanya Dua	SRMIST
8	Mrs.	Sharulatha B	SRMIST
9	Mr.	T.MONISH VARDHAN	SRMIST
10	Mr.	Thirupathi V	SRMIST
11	Mr.	Anwesh Dhar	SRMIST
12	Ms.	Jessica S	LICET
13	Ms.	Josephine Felcita K	LICET
14	Mr.	M. charan sarabeshwar	LICET
15	Mr.	N.GOWTHAM KANNAA	LICET
16	Mr.	Rithesh.K	LICET
17	Ms.	SAHANA.S	LICET
18	Mr.	Lakshminarayanaa R	National Institute of Wind Energy
19	Mr.	Arihant Chordia	SRMIST
20	Mr.	Divit Sugumar	SRMIST
21	Ms.	G.Madhunisha	SRMIST
22	Mr.	Hima Karthik Yanamadala	SRMIST
23	Ms.	Ishita Khare IK	SRMIST
24	Ms.	Kavin Mithra V	SRMIST

25	Mr.	Malek Mohammad Affan Juned	SRMIST
26	Mr.	SARATHKUMAR.P	ANNAI MIRA COLLEGE OF ENGINEERING AND TECHNOLOGY
27	Ms.	Jennifer Ruth Pauline G	LICET
28	Mr.	SUNDAR.D	ANNAI MIRA COLLEGE OF ENGINEERING AND TECHNOLOGY
29	Mr.	Adithiyha. P	LICET
30	Mr.	AROKIYANISANTH A	LICET
31	Ms.	ASHLIN DHARSINI J	LICET
32	Ms.	Damini S	LICET

Participant Certificate



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Kattankulathur - 603203

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Certificate of Participation

HANDS-ON TRAINING ON

CONTROLLER PROGRAMMING FOR RENEWABLE ENERGY APPLICATIONS

This is to certify that Dr./Mr./Ms. ISHITA KHARE I.K

from SRMIST has participated in the Hands-on Training on **"CONTROLLER PROGRAMMING FOR RENEWABLE ENERGY APPLICATIONS"** organized by the Department of Electrical and Electronics Engineering, SRMIST, Kattankulathur, in association with IEI - Kattankulathur Local Centre on 22nd January 2025.

Convenor

HOD EEE

Dean SoEEE

7. Photos

Inauguration

Introduction to Different Controller Programming for Renewable Energy Applications and Hands-on Training on Controllers and Controller Programming

Solar Street Light System Development

and Solar Panel Monitoring and Control and Its Programming

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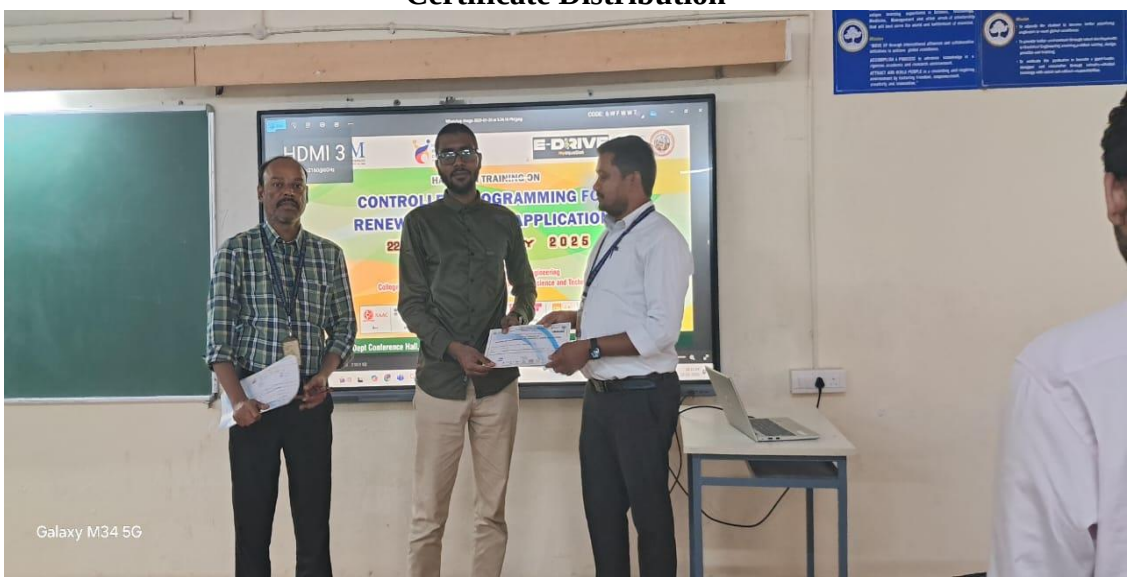
MyEquation Skill Tech

Hands on training on Battery management System, and BMS Programming and Battery testing controller

Certificate Distribution

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