

Vision of EEE Department

We develop globally competent Electrical and Electronics Engineer to solve real time problems of the industry and society and conduct research for the application of knowledge to the society.

Mission Statements for EEE Department:

In order to foster growth and empowerment, we commit ourselves to

- Develop electrical and electronics engineers of high caliber to meet the expectations of industries through effective teaching-learning process.
- Improve career opportunities in core areas of electrical and electronics engineering.
- Inculcate leadership qualities with ethical and social responsibilities

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A Six Days Online
AICTE Training and Learning
Faculty Development Programme
on

**Revolutionizing Electric Vehicle
Powertrains: The Role of Wide-Bandgap
Semiconductors in Overcoming
Challenges and Shaping Future Trends**

17th to 22nd February 2025

Sponsored by

AICTE, NEW DELHI
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Organized by

**Department of Electrical & Electronics
Engineering**



**Dr. Mahalingam College of Engineering
and Technology**

**(An Autonomous Institution,
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About College

Dr.Mahalingam College of Engineering and Technology (MCET) was established in 1998 by Dr.M.Manickam with a view to commemorate the 75th birth year of his beloved father Arutchelvar Dr.N.Mahalingam with a mission to impart high quality competency-based education in Engineering & Technology to the younger generation with the required skills and abilities to face the challenging needs of the industry around the globe.

MCET is a self-financing, co-educational engineering college, Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai. The Institute has been accredited by NAAC with A++ grade in Cycle III with the highest grade till 2030. MCET currently offers 12 UG programmes, 6 PG programmes and 7 Doctoral programmes. All eligible UG programmes accredited with NBA under Tier-1 category.

About the Department

The Department of Electrical and Electronics Engineering was established in 2002 and offers B.E (EEE) and M.E (Embedded System Technologies), recognized Research Centre under Anna University, Approved by AICTE, Affiliated to Anna University & Accredited by the NBA. The department has experienced faculty members who are fully committed to teaching and research, and dedicated to impart quality education to the students. The students have access to well equipped, state-of-the-art laboratories. A wide range of research activities undertaken in the department allow the students to gain contemporary knowledge about real-life problems in the industry. The department has brought out outstanding engineers in the past and will continue its service in the years to come.

About the Programme

The automobile sector is undergoing a transition due to the swift uptake of Electric Vehicles (EVs). The powertrain & mechanism that transforms electric energy into motion, is at the center of this transformation. Although essential to the early development of EVs, traditional silicon-based technologies are running out of steam in terms of efficiency, power density, and thermal control. Let us introduce Wide-Bandgap Semiconductors (WBGs), which include Gallium Nitride (GaN) and Silicon Carbide (SiC). These cutting-edge materials are redefining electric vehicle powertrains by offering increased dependability, smaller size, and efficiency. New benchmarks in EV powertrain economy, size, and performance are being established by Wide-Bandgap Semiconductors. WBG technology has the potential to completely transform the operation and design of electric vehicles by solving important issues like range, charging speed, and thermal management.

Topics to be covered

- Introduction to Wide-Bandgap Semiconductors
- WBG Devices in Electric Vehicle Powertrains
- Thermal Management and Reliability in WBG Devices
- Design and Optimization of Power Converters with WBG Devices
- Switching Behaviour and Efficiency Improvements
- Electric Vehicle Charging Systems
- High Frequency PCB designing.
- EMI and Noise Mitigation in WBG-Based EV Systems
- Future Trends and Research Directions
- Hands-on Sessions

Eligibility

Faculty members, Research scholars and PG Scholars of the AICTE approved institutions and Industry Personnel are eligible to apply.

Guidelines

- No participant fees will be collected
- Sessions will be conducted during the evening time (Refer the schedule given with this brochure).
- Eligible participants will be selected based on first come first serve basis and will be intimated by e- mail.
- Coordinators decision will be final regarding the selection of participants.
- The certificates shall be issued to those participants who are registered on ATAL portal www.aicte-india.org/atal and attend the program with minimum 80% attendance and score minimum 70% marks in the assessment.

Registration

Registration is mandatory for attending the FDP. The participants are requested to register in the ATAL portal.

<https://atalacademy.aicte-india.org/login>

Resource Persons

The sessions will be handled by experts from academia, research organizations and industry in the subject area.

Session Details

Day 1 (17.02.2025)	Day 2 (18.02.2025)	Day 3 (19.02.2025)	Day 4 (20.02.2025)	Day 5 (21.02.2025)	Day 6 (22.02.2025)
6:00PM to 6:30PM	6:00PM to 7:30PM	6:00PM to 7:30PM	6:00PM to 7:30PM	6:00PM to 7:30PM	2:00PM to 3:30PM
Inaugural Session	Session 3	Session 5	Session 7	Session 9	Session 11
	Performance benefits of WBG Devices in Electric Vehicle. Dr.Amit Kumar Assistant professor, Department of EEE, University of Cagliari.	Reliability concerns in WBG: switching losses, voltage spikes, and material robustness. Dr.V.Sandeep, Assistant Professor, Department of EEE, NIT, Andhra Pradesh.	Design considerations for integrating SiC and GaN devices in EV power electronics. Dr.Moumita Das, Assistant Professor, School of C & EE, IIT, Mandi.	Electric Vehicle Charging Systems. Dr.M.Kavitha, Senior Ideation Engineer, Digital Energy Solutions, PT&D, L&T Limited, Chennai.	Switching Behaviour and Efficiency Improvements. Mr.Vasumani, Lead Engineer, L&T Technology Services, Mysore.
6:30PM to 8:00PM	7:30PM to 9:00PM	7:30PM to 9:00PM	7:30PM to 9:00PM	7:30PM to 9:00PM	3:30PM to 5:00PM
Session 1	Session 4	Session 6	Session 8	Session 10	Session 12
Introduction to Wide-Bandgap Semiconductors Dr.S.Senthil Kumar Professor, Department of EEE, NIT, Trichy.	Challenges in heat dissipation and thermal management in high-power applications. Dr.N.Sendhil Kumar, Associate Professor, Department of ME, NIT Puducherry.	Hands-on Session: Simulation using LTspice Dr.M.Kaliamoorthy, Professor, Department of EEE, Dr.Mahalingam College of Engg. & Tech, Pollachi.	Gate driver circuits, protection techniques, and packaging for WBG devices. Dr.N.Rajasekar Professor, School of EE, VIT University, Vellore.	High Frequency PCB designing. Mr.Sukumar Balasubramanian, Manager PCB Design, Tessolve Semiconductors, Coimbatore.	EMI and Noise Mitigation in WBG-Based EV Systems. Dr.B.Venkatesa Perumal, Professor, Department of EEE, NIT, Surathkal.
Session 2					Session 13
8:00PM to 9:30PM					5:00PM to 6:30PM
Role of WBG semiconductors in EV systems: inverters, converters, and onboard chargers. Dr.S.Umashankar, Professor, Department of EE, Prince Sultan University, Saudi Arabia					Future Trends and Research Directions in WBG. Dr.V.Karthikeyan, Assistant Professor, Department of EE, NIT Calicut.
					6:30PM to 7:30PM Online test & feedback
					7:30PM to 8:00PM Valedictory Session