REGISTRATION AND CERTIFICATION

- **Maximum seats: 25** (selection based on merit and first come, first serve basis)
- **No Registration Fee**
- **Online registration form link:** https://forms.gle/EyUpEW87V9ViQ3pq8
- **Please fill the above Google form with the requested details and upload the scanned copies of the certificate, resume, and declaration form along with NOC (from the Project supervisor/HoD/Head of the institution) by Friday, 26th August 2022.**
- **The applications will be screened, and the candidates will be selected on merit. The selection committee's decision will be final in the selection of candidates.**
- **The selected candidates will be informed by email on or before 31st August 2022.**
- **The selected candidates will have to acknowledge participating in the workshop through return email (on or before 2nd September 2022), failing which the waitlisted candidates may be called to attend the workshop.**
- **Certificates will be provided to the participants after the successful completion of the workshop.**
- **Selected participants will be accommodated in Institute guest house/hostel rooms (if available) with catering facilities under the funds approved by SERB (as per norms).**
- **The participating students will be eligible for TA reimbursement for their journey to the host institute from their hometown/home institute, both ways, as per the GoI norms.**

IMPORTANT DATES

Last date of registration: 26/08/2022
List of selected students: 31/08/2022
Last date to accept the offer: 02/09/2022

Participants: Eligibility Criteria

1. **Only regular PG level (i.e., Masters or Ph.D.) students** pursuing their degree from AICTE approved University / Institution within India are eligible to apply.
2. **Relevant areas of specialization include (but are not limited to):** Power Electronics/Electrical Drives/Power and Industrial Drives/Power Systems and related domains.
3. **The applicants should produce a declaration form and a "No Objection Certificate (NOC)" from the Supervisor/Head of the Department/Head of the Institute, allowing their student to undergo training in the workshop if selected.**

CHIEF PATRON & CHAIRMAN

Prof. Udaykumar R. Yaragatti
Director, NIT Karnataka

CO-CHAIRMAN

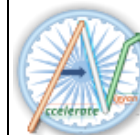**Dr. Dattatraya Narayan Gaonkar**
Head, E&E. Engg., NIT Karnataka

ADDRESS FOR CORRESPONDENCE

Dr Prajof P., Assistant Professor, EEE
National Institute of Technology Karnataka
Surathkal, Mangalore, Karnataka - 575 025
Email: prajof@nitk.edu.in
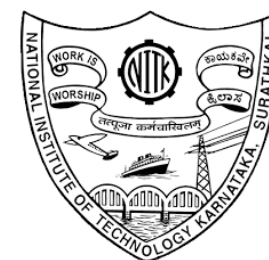Contact Number: +91- 9967325672
Website: https://www.nitk.ac.in/

SERB Sponsored

One Week High-End Workshop on

Power Electronic Systems and its Real-time Control Implementation using DSP-based Microcontroller
[Physical Mode]

(12th to 18th September 2022)

Event Organizer:
Dr. Prajof P.
Assistant Professor, EEE Department,
National Institute of Technology Karnataka,
Surathkal, Mangalore, Karnataka - 575 025

Organized by:
Department of Electrical and Electronics Engineering, National Institute of Technology Karnataka, Surathkal, Mangalore, Karnataka.
https://eee.nitk.ac.in/

***Venue*:** **Dept. of Electrical and Electronics Engineering, NITK Surathkal, Mangaluru – 575025**

Accommodation: A limited number of rooms in NITK Guesthouses/Hostels are available on First Come, and First Served basis. THE HOST INSTITUTION SHALL BEAR the boarding and lodging within the NITK premise only (from the SERB fund). If unavailable, the participants need to make self-arrangements for their stay outside the NITK premise, which the organizers do not bear. TA will be reimbursed for the train or bus's lowest fare.

About the Institute

National Institute of Technology Karnataka (NITK), Surathkal (formerly KREC), is one of the institutes of National importance in our country funded by MHRD, the Government of India. Since its inception in 1960 as the Karnataka Regional Engineering College, the Institute has established itself as a premier centre engaged in imparting quality technological education and supporting research and development activities. NITK has carved a niche for itself among the best technical institutes in India and is consistently ranked among the top 10 technological institutions.

About the Department

The Department of Electrical and Electronics Engineering was established in the year 1960. The department offers an undergraduate B.Tech. Program in Electrical and Electronics engineering. The postgraduate (M.Tech.) programme in Power and Energy Systems was introduced in 1992, and research programmes leading to Ph.D. degrees started in 2003. It has a well-qualified and experienced faculty team actively engaged in research and development activities. The department is continuously fulfilling its role of producing qualified Electrical Engineer Engineers suited for the current industrial growth scenario. Many of our Ph.D. graduates have taken up faculty positions in other NITs and IITs.

About the Karyashala Scheme

KARYASHALA is a program offered by the Science and Engineering Research Board (SERB), Government of India, via Accelerate Vigyan scheme to boost Research & Development in the country by enabling and grooming potential PG level students (masters and Ph.D. students) by developing dedicated research skills in selected areas/disciplines through high-end workshops. This program aims to provide opportunities to acquire specialized research skills.

About the Workshop

Today, most modern power electronic systems are equipped with DSP-based microcontrollers. Modern microcontrollers simplify power control and conversion and ensure high efficiency. They also increase the power density of the system, help make intelligent and optimized decisions, and are utilized in generating high-quality gating signals. Hence, a workshop on a DSP microcontroller for power electronic control applications shall be helpful to potential Ph.D./M.Tech students.

This workshop shall focus on a recent trend in power electronic systems and their real-time control implementation using a DSP-based Microcontroller. Hands-on programming and implementation session on the latest DSP microcontroller will be included in this workshop. Overall, this workshop shall serve to be an excellent platform for upgrading the participants' knowledge in the domain of microcontroller applications to power electronics.

Objectives of the Workshop:

a. **To impart knowledge about various modern power electronics systems and their real-time control implementation in a DSP-based Microcontroller.**
b. **To explain the fundamentals of the latest DSP microcontroller, it's programming and interfacing aspects for power electronic systems.**
c. **To impart hands-on training to set up and program DSP microcontroller to implement power electronics-based algorithms.**

Course Contents:

- **Control of Power Electronic Converters.**
- **Basics of Digital Signal Processor-based microcontroller.**
- **DSP control board and programming aspects.**
- **LED blinking and PWM generation (SPWM and SVM).**
- **Interface circuits in a DSP-controlled power electronics system.**
- **ADC and phase-locked loop implementation.**
- **Digital control of dc-dc and ac-dc power converters.**

Resource Persons

Subject experts from prestigious academic institutions (like IITs, NITs, etc.), R&D organizations, and industries will deliver the workshop contents. The event organizer and student volunteers will mentor the hands-on sessions.

Event Schedule (Tentative):

Day	Session & Timings	Program
12-09-22 (Monday)	Inauguration 10 AM to 10.30 AM	**Inauguration** of the workshop by Chief Guest and Guest of Honor.
	Session-1 (FN) 10.30 AM – 12.30 PM	Lecture on **"Power Electronic Systems and its applications."**
	Session-2 (AN) 2.00 PM – 5 PM	Lecture and Hands-on session on **"Basics of Digital Signal Processor based Microcontroller – Timers and LED blinking."**
13-09-22 (Tuesday)	Session-3 (FN) 9.00 AM – 10.30 AM	Lecture on **"Control and Signal Conditioning Circuits for Power Electronics."**
	Session-4 (FN) 11.00 AM – 12.30 PM	Lecture on **"Interface Design: DSP and Power Electronic System"**
	Session-5 (AN) 2.00 PM – 5 PM	Lecture on **"Programming of DSP"** and Hands-on session on "**Introduction to DSP Control Board and Programming aspects**" and **"Signal conditioning Circuits."**
14-09-22 (Wednesday)	Session-6 (FN) 9.00 AM – 11.00 AM	Lecture on **"Control of Power Electronics Systems & PWM Techniques."**
	Session-7 (FN) 11.30 AM – 1.00 PM	Lecture on **"Introduction to Digital Control of Power Electronics"**
	Session-8 (AN) 2.30 PM – 5.00 PM	Hands-on session on "**EPWM and SPWM and SVM pulse generation."**
15-09-22 (Thursday)	Session-9 (FN) 9.00 AM – 10.30 AM	Lecture on **"Conditional Monitoring and Reliability of Power Electronic Converters."**
	Session-10 (FN) 11.00 AM – 12.30 PM	Lecture on "**Implementation Issues of Power Electronic systems in DSP.**"
	Session-11 (AN) 2.00 PM – 5 PM	Hands-on session on "**ADC and Digital filters in DSP control board."**
16-09-22 (Friday)	Session-12 (FN) 9.00 AM – 10.30 AM	Lecture on **"Power Electronics application to renewable energy and microgrids."**
	Session-13 (FN) 11.00 AM – 12.30 PM	Lecture on **"Power Electronics application to electric vehicles."**
	Session-14 (AN) 2.00 PM – 5 PM	Lecture on **"Simulation Tool for Implementing Power Electronics System"** and Simulation session on "**Closed-loop control of DC-DC converter."**
17-09-22 (Saturday)	Session-15 (FN) 9.00 AM – 10.30 AM	Lecture on **"DSP Implementation of control strategy of a grid inverter."**
	Session-16 (FN) 11.00 AM – 12.30 PM	Lecture on **"DSP Implementation of Solar PV based off-grid system & battery back up."**
	Session-17 (FN) 2.00 PM – 5 PM	Hands-on session on "**Closed-loop control of power converters using DSP Microcontroller."**
18-09-22 (Sunday)	Session-18 (FN) 9.00 AM – 11.00 AM	Lecture on **"Phase Locked Loop for Power Electronics Application."**
	Session-19 (AN) 11.00 AM – 12.30 PM 2 PM – 3.30 PM	**Simulation and Hands-on session on PLL**
	Valedictory session and Certificate Distribution 4 PM to 5 PM	**Valedictory Ceremony** of the workshop

Note: Subject experts from prestigious academic institutions (like IITs, NITs, etc.), R&D organizations, and industries shall deliver the workshop contents. The event organizer and student volunteers shall mentor the hands-on sessions/simulations/experimental demonstrations.

Power Electronic Systems and its Real-time Control Implementation using DSP-based Microcontroller
[Physical Mode]

DECLARATION FORM

1. Name (In Block Letters): ....

2. Date of birth: ……………………………………Gender: ....

3. Category (M.Tech/M.E/M.S./Ph.D. student): ....

4. Institution: ....

5. Department: ....

6. Mobile: ....

7. e-mail: ....

8. Specialization: ....

9. Accommodation is required (Yes/No)..

10. Official Address: ....

    ....

Declaration: The information provided is true to the best of my knowledge. If selected, I agree to abide by the rules and regulations of the program and shall attend the course for the entire duration.

Name & Signature of the candidate

No Objection Certificate (NOC) from Project Supervisor/HoD/Head of Institution

I hereby certify that Mr./Ms. …………………….. is a …………………… (M.Tech/M.E/PhD) student of …………………………………… ……………………………………. I have no objection to him/her undergoing a high-end workshop **(if selected)** on **"Power Electronic Systems and its Real-time Control Implementation using DSP-based Microcontroller"** at the National Institute of Technology Karnataka, Surathkal, from **12th to 18th September 2022**.

Place: Name & Signature of Project
                                                              Supervisor/HoD/Head of Institution
Date:

(Department/Institute Seal)