

### Whom will the course benefit?

Electrical engineering faculty, researchers and practicing engineers who are interested in modeling, simulation and real-time simulation of power converters, power apparatus and networks

### Course Objective:

- Mathematical modeling of power converters, apparatus and networks.
- Numerical techniques, offline simulation and simulation exercises.
- Introduction to an educational real-time simulator developed as part of a national project.
- Hands-on sessions on the educational real-time simulator.

### Course Contents:

1. Numerical methods: explicit and implicit methods; offline simulation of simple circuits.
2. Power converters, apparatus and networks: dc-dc converters, voltage source inverter, synchronous machine, transformer, transmission line, single-machine infinite bus system, IEEE 3-generator system.
3. Review of continuous-time models of power converters, apparatus and networks; discrete-time modeling of power elements and networks using different numerical techniques; Euler forward, Euler backward, trapezoidal and Adomean decomposition; offline simulation.
4. Educational real-time simulator (miniature full-spectrum simulator): Introduction and overview; architecture and system organization; examples of subsystem hardware and firmware; programming environment; programming with built-in parser; programming in C; multiprocessor programming
5. Real-time simulation exercises: simple circuit examples, dc-dc converters, voltage source inverter, induction machine, synchronous machine, a simple micro-grid (i.e. inverter and DG set)

### Faculty:

IISc faculty, guest faculty from IIT Bombay and scientists from CDAC, Thiruvananthapuram, will deliver the lectures and handle the hands-on sessions.

### Eligibility:

The course is meant for faculty of engineering colleges recognized by All India Council for Technical Education (AICTE), National Institutes of Technology (NIT’s) and National Institute of Technical Teachers’ Training & Research (NITTTRs). Selected teachers will be paid TA at actual subject to the limit of Three tier AC train/bus fare by the shortest route from the place of work to Bengaluru and back. **However, the maximum TA payable is Rs.3000/-.** They will be provided with a daily allowance of Rs.500/- (for 5 days only) towards boarding and lodging as per QIP rules, and will be supplied with the course materials. **The lodging charges will be Rs.300/- per day. Local participants will be paid DA @ Rs.150/- per day for 5 days.**

In addition, a few seats are available for non-sponsored (self-support) teachers, scientists from research labs, practicing engineers from industries and other interested persons on payment basis as under.

### Course Fee:

Academic Institutes, Govt. R&D Labs: **10,000 INR**  
Private Industries : **15,000 INR**

This will entitle them to participate in the course and receive the course material. Single room **accommodation** is available on the Institute campus at the **Hoysala House**. The participants have to request in advance along with the registration form for such accommodation. The lodging charges will be **Rs.1000/- per day** for self-support college teachers, and **Rs.1500/- per day** for Industry participants, subject to availability of accommodation.



CENTRE FOR CONTINUING EDUCATION  
Indian Institute of Science,  
Bengaluru –560 012

*QIP Short Term Course On*

## “Real-Time Simulation for Power Electronics and Power Systems Applications”

**10-14 July 2017**

### Registration Form

(Please mail to reach before **10 May 2017**)

1. Name.....
2. Age:..... Sex: Male/Female
3. Office address  
.....  
.....  
.....
4. Landline No. with STD code:.....
5. Mobile No. ....
6. Email ID:.....
7. Academic Qualifications  
Degree                                      subject                                      year                                      University  
Diploma/B.Sc./B.A.....  
B.E/B.Tech/M.Sc. ....  
M.E/M.Tech./M.Phil.....  
Ph.D. Completed/Pursuing/Intend pursuing:.....  
Thesis title/Proposed Research Area:.....  
.....  
.....
8. Teaching Experience.....(Years)
9. Industry Experience .....(Years)

10. Course taught/professional responsibilities.....  
.....  
.....  
.....

11. Accommodation required Yes / No

12. Self-support candidate :  
Academic Institutes, Govt. R&D Labs: **Rs. 10,000**  
Private Industries : **Rs. 15,000**

Demand Draft No..... dated.....

I agree to abide by the rules of the QIP courses. If selected, I shall participate in the course for the entire duration.

Date: \_\_\_\_\_  
Place: \_\_\_\_\_ Signature \_\_\_\_\_

The applicant Mr/Ms.....

.....  
from our institution will be permitted to attend the QIP Short Term Course on “**Real-Time Simulation for Power Electronics and Power Systems Applications**” to be held during **10-14 July 2017** at the Indian Institute of Science, Bengaluru, if selected. He/she will be granted necessary leave of absence.

It is certified that our college is recognized by AICTE Order No:.....Date:.....

Date: \_\_\_\_\_  
Place: \_\_\_\_\_ Signature of Head of the Department \_\_\_\_\_

Signature and Seal of the Principal of the Institution

Intending participants may use the attached application form or a xerox copy of the same. Applicants from AICTE recognized colleges, NIT’s and NITTTRs are required to submit their applications sponsored by their colleges.

Non-sponsored (self-support) teacher applicants should send their application along with a **DD for the course fee** drawn in favor of “**Registrar, Indian Institute of Science, Bengaluru -560012**” payable at Bengaluru. The course fee will be **Rs. 10,000** for participants from **academic institutions and government research labs**, and **Rs. 15,000** for participants from **other organizations**.

**Deadlines:**

Receiving completed applications: **10 May 2017**

Intimation of selection: **15 May 2017**

*Please mail the filled-in application form to*

The Officer-in-charge  
Centre for Continuing Education  
Indian Institute of Science  
Bengaluru - 560 012  
Telephone: 080-23600911, 22932055  
Email: admin@cce.iisc.ernet.in/  
office@cce.iisc.ernet.in

**To reach on or before: 10 May 2017**

(Xerox copy of this form may also be used)

*QIP Short Term Course On*  
**“Real-Time Simulation for Power Electronics and Power Systems Applications”**

**10-14 July 2017**

**Coordinator(s)**

**Prof. G. Narayanan**  
**Dr.Gurunath Gurrala**  
**Dept. of Electrical Engineering**

Sponsored by  
AICTE, NEW DELHI



Centre for Continuing Education  
Indian Institute of Science  
Bengaluru – 560 012  
<http://www.cce.iisc.ernet.in>