

**AICTE-MHRD  
STAFF DEVELOPMENT PROGRAMME  
ON  
Recent Trends in Power Electronics, Machine Drives and  
Power Systems  
19th January to 1st February 2009**

**Introduction**

With fast developments in semiconductor technology, high performance power electronic devices and signal processors are getting commercialized regularly. Consequently power electronics, machine drives and power system technology is advancing very fast. So there is necessity of updating the knowledge with state-of-the-art developments in these fields. This training program will help the participants to update their knowledge, and to target research problems in power electronics, machine drives and power systems. Participants will be given adequate exposure to modern equipments of power electronics laboratory and different simulation software like PSIM, and MATLAB/SIMULINK.

**Course Contents:**

Introduction to power semiconductor devices and converters, PWM converters, different PWM techniques: space vector PWM, sinusoidal PWM with instantaneous current control, hysteresis band current control, sigma delta modulation; three level and multi level converters, soft switched converters.

Introduction to dc and ac motor drives, dynamic d-q model of ac machines, slip power recovery drives, control and estimation of induction motor drives, direct and indirect vector control; stator flux, rotor flux, and airgap flux orientation; sensorless vector control, direct torque control, sliding mode control and fuzzy control of induction motor drives, control and estimation in synchronous machines, switched reluctance motor drives, control of induction generator for wind energy conversion systems.

Overview of electrical power systems engineering, uncompensated and compensated lines: series and shunt compensation, FACTS, STATCOM, DVR, UPFC; active and reactive power control, harmonic studies of power compensating plants, transient studies of FACTS and custom power equipment.

Laboratory exposure to modern equipments of Power Electronics Laboratory; and simulation software like PSIM, and MATLAB/SIMULINK.

## **Venue**

The course will be organized at the National Institute of Technology (NIT), Rourkela. It is one of the premier national level institutions for technical education in the country and is funded by the Government of India. It is situated at the eastern end of Rourkela steel city, beyond Sector-1 over an area of 262 hectares of land. NIT Rourkela has fourteen academic departments which offer B.Tech, M.Tech and PhD programs in various areas of engineering and technology. The Institute is a participant of the Technical Education Quality Improvement programme of Government of India.

## **Department of Electrical Engineering**

Department of Electrical Engineering, NIT Rourkela was established in 1961. Since its inception, the Department is under dynamic progress and is reputed for imparting quality education both at B.Tech, M.Tech levels. The Department currently runs two M.Tech programmes with the specializations in (i) Power Control and Drives, (ii) Electronic Systems and Communication. Besides the undergraduate and postgraduate teaching, a good number of research scholars are working on different areas of Electrical Engineering towards the award of PhD degrees. The Department has well equipped modern laboratories such as Power Electronics & Drives, Machines Lab, Power System, Control & Robotics, Signal Processing & Communication, Image Processing & Computer Vision, Embedded Systems & Real-Time and Soft Computing Labs for pursuing research in the emerging areas of Electrical Engineering.

## **Faculty**

NIT Rourkela has a good number of Professors specialized in the area of Power Electronics, Machine Drives and Power System, who have designed the course and will deliver lectures. In addition to this, experts from IIT Kharagpur will deliver a number of lectures.

## **Who should attend**

Faculty from AICTE approved Institutions with Bachelor's degree in Electrical/ Electronics/ Instrumentation/ Control Engineering are eligible to attend.

## **TA for Participants**

The participants are entitled to avail III AC Train Fare. The reimbursement of TA will be made as per AICTE guide lines such as production of necessary travel documents.

## **Accommodation**

Participants will be provided either boarding and lodging in the Institute Guest House, or DA of Rs.500 per day.

## **Registration**

There is no registration fee for the faculty members of AICTE (All India Council for Technical Education) approved institutions, as the course is fully sponsored by the AICTE, New Delhi. Candidates should send filled in registration form as e-mail attachment, followed by signed copy from the employer, to the coordinators on or before 09th January, 2009.

The number of seats is limited to 60. Therefore, interested faculty members should apply well within the scheduled time frame i.e., 9th January 2009.

## **Correspondence**

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AICTE–MHRD Staff Development Programme  
on  
**Recent Trends in Power Electronics, Machine Drives  
and Power Systems**  
19 January – 01 February, 2009

1. Name: \_\_\_\_\_

2. Designation: \_\_\_\_\_

3. Specialization: \_\_\_\_\_

4. Department: \_\_\_\_\_

5. Organization: \_\_\_\_\_

6. Teaching Experience: \_\_\_\_\_

7. Mailing Address: \_\_\_\_\_

\_\_\_\_\_

Phone \_\_\_\_\_

FAX \_\_\_\_\_

E-mail (must): \_\_\_\_\_

8. Accommodation required: YES / NO

Date

Signature

**Sponsorship Certificate**

On the event of selection, Mr/Ms. \_\_\_\_\_ will be relieved for participating in the above programme.

SIGNATURE OF THE HEAD OF THE INSTITUTE /SPONSORING AUTHORITY  
(WITH DATE AND SEAL)