

Introduction

This course presents the theory and applications of digital signal, speech and image processing with MATLAB. Numerous examples and practical hand-on exercises are included in the course. One major topic of digital signal/ speech/ image processing is covered in each lecture, typically consisting of a discussion of the basic theoretical concepts and some examples illustrating practical problems and their solutions. The lectures will provide a practical learning experience.

For this course the target groups are the teachers from Engineering Colleges belonging to Electronics, Electrical, Computer, Mechanical and Mechatronics disciplines. The objective of this course is to introduce the trainee-teachers the recent developments in this field so that the latest technologies will in-turn pass on to the younger mass (students) and to initiate research in the fast growing signal processing field.

Course Contents

Part-A: DIGITAL SIGNAL PROCESSING: Discrete-time Signals and Systems, Convolution and Correlation, Transforms: DFT, Z-Transform, DCT, DHT, DWT, Fast Computation Algorithms, Filter Design: FIR and IIR Filters, Adaptive Filters, Recent Developments

Part-B: DIGITAL SPEECH PROCESSING: Fundamentals of Speech Processing, Digital Representation of Speech Waveform, Linear Predictive Coding of Speech, Speaker and Speech Recognition Systems, Recent Developments

Part-C: DIGITAL IMAGE PROCESSING: Fundamentals of Image Processing and Computer Vision, Transforms, Image Enhancement and Restoration, Spatial-Domain Processing, Frequency-Domain Processing, Color Image Processing, Image Compression, Image Segmentation, Object Recognition, Recent Developments

Part-D: MINI PROJECT: A project on any of the three areas with MATLAB/ Sundance Systems/ Matrox Imaging Systems

Resource Persons

The faculty of Electronics & Communication Engineering Department, NIT Rourkela will form the core group for conducting this course. In addition, some Professors from Electrical Engineering and Computer Science and Engineering Departments will deliver lectures on special topics in this field. Further, some Eminent Guest Faculty will be invited from leading technical institutions of the country.

Eligibility

The programme is open to the all faculty members of Electronics, Electrical, Computer, Mechanical and Mechatronics engineering departments of AICTE approved engineering, MCA and MBA Institutions. Faculty members from other departments who work in the field of digital signal/speech/image processing are also eligible to apply.

Selection

The number of teacher-participants is **limited** to **60** as per AICTE-MHRD guidelines. The seats will be filled up on a **first-come first-served** basis.

Registration

Registration form in the prescribed format along with the refundable registration fee of **Rs 300/=** (Rupees THREE HUNDRED only) in the form of a crossed Demand Draft, drawn in favour of **Continuing Education, NIT Rourkela**, and Payable at Rourkela, should reach the Coordinator on or before 05-02-2009.

The registered participants will be intimated vide email and the list will published in the institute web site www.nitrkl.ac.in by 09-02-2009.

Registration fees will be **refunded** to participant who attend the course as well as to the applicants who are not selected for the course.

Important Dates

Last date of submission: 5th February 2009

Intimation of acceptance: 9th February 2009

TA and Accommodation

Travelling Allowance to the extent of **AC-3** Tier by the shortest route will be reimbursed to the participants upon submission of both-way tickets. The registered participants will be provided **free boarding and lodging** in the institute Guest House/ Hall.

Address for correspondence

Prof S Meher

**Coordinator, AICTE-MHRD SDP: DSSIP
Electronics & Communication Engineering
Department
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APPLICATION FORM

AICTE-MHRD Sponsored
Staff Development Programme (SDP)

on

Digital Signal, Speech and Image Processing:
Theory and Applications

1. Name: _____
2. Email-id: _____
3. Contact No: _____
4. Designation: _____
5. Institution: _____
6. Department: _____
7. Whether the Institution has
AICTE Recognition: YES / NO
8. Address for Correspondence: _____

9. Experience (in years): _____
10. Accommodation required: YES / NO
11. DD details:

Signature of the Applicant

SPONSORSHIP CERTIFICATE

Dr/Mr/Ms _____ is a faculty member of our Institute/ College and is hereby sponsored to participate in the AICTE-MHRD SDP on "Digital Signal, Speech and Image Processing: *Theory and Applications*" from 16th Feb to 1st Mar. 2009 at Department of Electronics and Communication Engineering, National Institute of Technology, Rourkela.

Date: __/__/2009

Signature of Head of Institution
(with seal)

About the Department

The Electronics and Communication Engineering Department offers two **B. Tech.** programmes: (i) **Electronics & Communication Engg.** and (ii) **Electronics & Instrumentation Engg.** In addition, two **M. Tech.** Programmes: (i) **Telomatics and Signal Processing** and (ii) **VLSI Design and Embedded System** are offered by the department. Moreover, it offers **M. Tech. (Research)** and **Ph.D.** programmes in various specializations such as **Digital Signal Processing, Digital Image Processing, Soft Computing, Communication, VLSI Design and Instrumentation Engineering.**

The Department has earned name in imparting effective education, research, technology development and training in these fields. It also collaborates with Industry, Academic and Professional bodies and is actively engaged in a number of technology development sponsored projects. It is accredited by NBA for five years. The department is having distinguished faculty in the area of the proposed short term programme.

About the Institute

The National Institute of Technology, Rourkela was founded as Regional Engineering College on 15th August 1961. It is one of the premier national level technical institutions in the country with reputation for excellence at under graduate, post graduate and doctoral levels. The institute boasts of its state-of-the-art academic and research infrastructure. The institute spreads over 262 hectare of lush green picturesque landscape. It aims at intellectual growth in a community-friendly ambience.

Rourkela is situated on the **Howrah-Mumbai main line** and is well connected with Kolkata, Delhi, Chennai and Mumbai as well as with state capitals, Bhubaneswar, Ranchi and Raipur. The institute is located about 7 km away from Rourkela Railway Station and is simply 2 km apart from Sector-2 Bus Station.

AICTE-MHRD Sponsored Staff Development Programme

on

**Digital Signal, Speech
and Image Processing:**
Theory and Applications

(16th February – 1st March 2009)



Coordinator

Prof S. Meher

DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING

NATIONAL INSTITUTE OF TECHNOLOGY
ROURKELA – 769 008
ORISSA