Mechanical Engineering Department

The erstwhile Regional Engineering College, Rourkela was converted to a deemed to be university and renamed National Institute of Technology, Rourkela on 26th June 2002. It was declared as an institution of national importance by the act of parliament on 15th August 2007. The institute has made a rapid stride in earning a reputation as a place of higher learning in the field of engineering during the last decade. The mechanical engineering department is one of the oldest departments being set up from the date of inception of the institute in the year 1961. It is the first QIP center of the Institute. The department offers five specialisations under M.Tech degree and has more than hundred Ph.D. research scholars enrolled. The department is well equipped with infrastructure to meet the requirements of UG, PG courses and to carry out advanced level research work.

How to reach NIT Rourkela?

Rourkela is on the Howrah (Kolkata) - Mumbai main line of South Eastern Railway. The railway station and intrastate bus stand are 6kms and 2kms from NIT Rourkela campus, respectively. The airports near to Rourkela are Ranchi, Bhubaneswar and Kolkata. Rourkela is well connected to these cities by rail and train frequency is very good.

Important Dates

Last Date of registration: 17th June 2016
Selection Intimation to the applicant: Through E-mail only
Course Date: 21st – 24th June. 2016.

A Short Term Course

on

COMPOSITE MATERIAL PROCESSING ANALYSIS AND OPTIMISATION (CMTPAAO-2016)

### 21st June. – 24th June 2016

Organised by

Department of Mechanical Engineering
National Institute of Technology
Rourkela 769008 India

Address for correspondence
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Introduction

Composites became more and more to a significant topic for innovative engineering solutions. At this point of time, they are the best alternative for steel and comparable metals in terms of stiffness, mechanical properties and weight saving. In general, composites are made out of fibers, which are embedded in a complex polymer matrix. The simulation and optimization of composite structure can be realized in several ways. The necessary explanation of the mechanics of composite structure in accordance with the physical reality is also very much important. The finite element method is widely used for the complex boundary value problems encountered in advanced composite structure. In addition, the complicated geometries and variations of material properties can also be handled using FEM ease. Due to these advantages, FEM has emerged as a versatile and powerful tool in computational engineering. Due to the exponential development of computing power, the process of optimizing structures has rapidly evolved in last decades from the experience and knowledge of engineers to automatic tools based on more or less classical mathematical algorithms and techniques. These advancements have enabled the possibility of efficiently treat complicated problems where the mechanical intuition is very limited, and this may reduce the cost of long periods of design through trial and error. By the end of this program, participants will have a comprehensive understanding of processing, modeling and optimization of composite materials and structures.
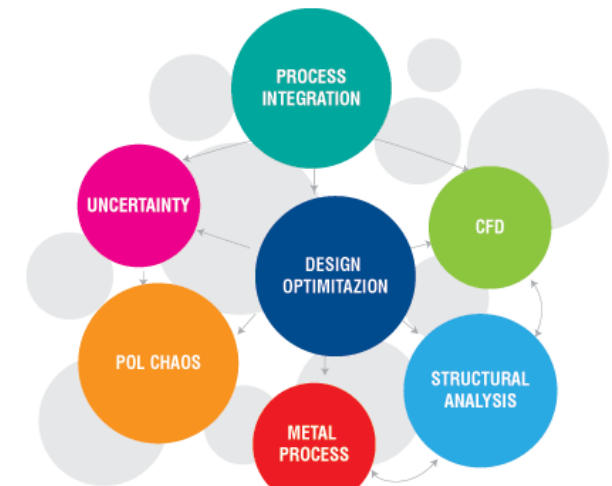
Course outline

Module I
Introduction, Background and Overview
Introduction to composite material and processing steps.
Module II
Mechanics based analysis of Composite structure and FEM
Mechanics of composites, property evaluation Finite element analysis, Applications of FEM to 1-D and 2-D Problems
Module III
Modelling in ANSYS/ABAQUS
Modelling and analysis of laminated structure using FEM tool and hand on practice.
Module IV
Optimisation of Composite Structure
Introduction to optimisation, methods and case study and hand on practice.

Who should attend?
All practicing engineers working in private, public, government organizations/industries, scientists/engineers from R&D establishments, faculties, research scholars and students from engineering institutions are eligible to apply.

Resource persons
Faculties from NIT Rourkela and professionals from industries.

Course fee
Professionals from Industry & R&D units: **Rs. 8,000/-**
Faculty from Academic Institutions: **Rs. 4,500/-**
Students/Research Scholars: **Rs. 3,500/-**
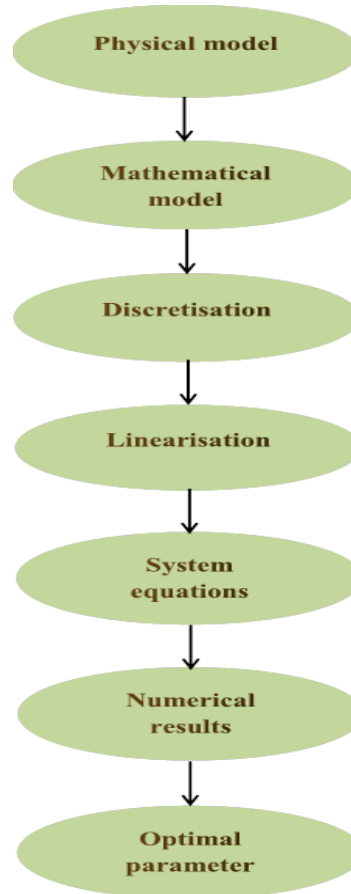The course fee includes course material and working lunch.
Participant who attends the full course will be issued a certificate of participation.

How to apply?
Interested participants may send their application in prescribed form along with the registration fee to the program coordinator on or before June 16th, 2016.

Mode of Payment
All payments should be made through A/C Payee Demand Draft drawn in favour of **"Continuing Education, NIT Rourkela" payable at SBI, NIT Campus Branch, Rourkela (Code-2109)**.

Physical model

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Mathematical model

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Discretisation

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Linearisation

↓

System equations

↓

Numerical results

↓

Optimal parameter

Boarding and Lodging
Accommodation on twin sharing basis can be arranged in the institute hostels/guest house subject to availability and on prior payment.
Room tariff (May change without notice).
Twin sharing per person per day: Rs.600/- (South Block)
Twin sharing per person per day: Rs.300/- (North Block)
Breakfast and dinner can be availed in the hostel/guest house on payment.
There are also many good hotels in Rourkela; the same can be booked on request and prior payment.

Note:
- **Incomplete registration form/without DD will be rejected.**
- **Registration fee is non-refundable.**
- **No TA/DA will be provided to the participants.**
- **Only limited number of participants will be selected on first-cum-first serve basis.**

APPLICATION FORM

Short Term Training Program

on

COMPOSITE MATERIAL PROCESSING ANALYSIS AND OPTIMISATION (CMTPAAO-2016)

(21st June – 24th June 2016)

Last date of registration: 13th June 2016

Name:

Gender: M / F

Highest Qualification:

Designation:

Organisation:

Address: --

E-mail: ---

Mobile No: --

Details of registration fee:

D.D. No:

Amount: **Date:**

Place: **Signature**
Date: