

## Registration form

Name: \_\_\_\_\_

Designation: \_\_\_\_\_

Organization: \_\_\_\_\_

Address for correspondence: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

E-mail: \_\_\_\_\_

Phone: \_\_\_\_\_

### Particulars of Registration Fee:

DD No.: \_\_\_\_\_ Date: \_\_\_\_\_

Amount: \_\_\_\_\_ Bank: \_\_\_\_\_

Accommodation Required: Yes/No

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

Place: \_\_\_\_\_

The complete registration form accompanied by DD of requisite amount may be mailed well in advance to the coordinator. Payment in form of DD should be made in favor of "Director, NIT Rourkela", payable at Rourkela.

## Workshop venue

The workshop will be conducted in Department of Metallurgical and Materials Engineering, NIT Rourkela (established in 1964). The department has been emerged as powerhouse for academics, scientific research and cutting edge technologies. With time, the department grew noticeably and established new areas of research and teaching in materials engineering, while retaining its strength in traditional areas in metallurgical engineering. The well developed infrastructure and diversified expertise of the faculties have provided the department a global acceptance. The department is actively involved in research activities in the front line areas of metallurgical and materials engineering in collaboration with reputed R&D organizations and industries throughout the country.

### Workshop objectives

This program promote the leadership instinct and capabilities to develop materials among industrious managers. The prime objectives of the programme will be:

- To guide each personnel for successful careers in the esteemed organization by understanding the underlying theory and rationality behind process run in developing the materials that can sustain in aero-parameter changes.
- To equip managers with a wider understanding of the quality issues associated with material development.
- To understand the cross-discipline/department knowledge and information transfer for combating industry materials developing oriented problems, introducing technological innovation and making strategic vision to drive change, and future growth.

### Convener

**Dr. Ajit Behera**

Assistant Professor

Dept. of Metallurgical & Materials

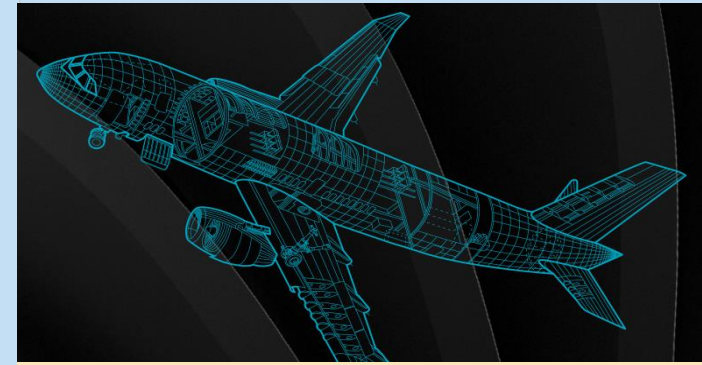
Engineering

NIT Rourkela

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## National Workshop on Aero-craft Processes and Aero-Materials

23<sup>th</sup> – 27<sup>th</sup> May, 2019



Organized by

**Metallurgical & Materials Engineering**

**National Institute of Technology Rourkela**

**Rourkela-769008**

**Odisha, India**





## Introduction to the Workshop

Aircraft design is a compromise between many competing factors and constraints and accounts for existing designs and market requirements to produce the best aircraft.

Most airplanes today are made out of aluminum, a strong, yet lightweight metal. Other metals, such as steel and titanium, are sometimes used to build aircraft. Titanium is almost as strong as steel, has a medium weight, is heat resistant, and is corrosion resistant. Some of the most basic parts of air vehicle are the engines, tail, wings, cockpit, fuselage, and landing gear. The engines are the large spherical devices found under or above the wings that propel the plane forward. Aircraft in flight, lift forces act upward against the wings, tending to bend them upward. The wings are prevented from folding over the fuselage by the resisting strength of the wing structure. The bending action creates a tension stress on the bottom of the wings and a compression stress on the top of the wings.

The aim of this workshop is to develop an understanding of principles of metallurgical processes, materials design, metallurgical strength, and development of metallurgical processes. Many of the unique features of metallurgical systems have been described in sufficient detail and numerous illustrative examples have been included so that it should also be useful for future metallurgical engineers working in the development period of new processes and/or in the continuation of the current processes. This five days workshop is intended to serve as a comprehensive lab course in aero-metal-component metallurgy for the metallurgical engineering & materials science sectors. The program structure aims to strengthen the understanding of the students in the core areas of metallurgical and materials engineering in order to meet the needs of the Indian industry as well as R&D organizations.

## Workshop outline

Days	Focused Area
Day-I (23/05/2019)	Aero-engine turbine construction concept and turbine blade microstructure analysis using scanning electron microscopy
	Microstructural analysis of Ni-based and Ti-based single crystal and polycrystalline turbine blade using SEM and XRD
Day-II (24/05/2019)	Analysis of Nanostructured engine-cover and stress distribution on aero-frame and ero-engine parts
	Thermal analysis of Ni-based superalloys by differential scanning calorimetric
Day-III (25/05/2019)	Different process for single crystal growth for aero-engine
	Thermal analysis of ceramic powders used for abradable coating on the surface of turbine engine inner cover by high temperature microscopy.
Day-IV (26/05/2019)	Characterization of high temperature turbine blade
	Morphology study on smart materials used in wings rib.
Day-V 27/05/2019	Thermal heat relief rate analysis by high mass flux cooling test m/c.
	Valedictory session

## Who should attend?

- Young faculties
- Aero-component manufacturing individuals
- Surface engineering personnel, aero-designers, -architects, -technical managers, -inspection and -maintenance engineer
- Materials Quality control personnel
- Facility owners and user who are concerned with aero-component

*The Successful participants who will attend the whole will be given participation certificate.*

## Important Dates

Last date for receipt of application is 10<sup>th</sup> of May 2019 and the notification of acceptance will be by 15<sup>th</sup> of May 2019.

## Registration Fees

Faculties from institutes	: INR 3000
Industry delegates	: INR 5000
Research Scholar	: INR 1000

The workshop fee includes lab course material, breakfast, lunch, and refreshment during the program days.

Participants (Faculty members and Ph.D. students) from NITRKL are exempted from paying registration fees.

## Accommodation

Accommodation will be provided in institute guest house on first come first serve basis. Double occupancy rooms for scholars and young faculties.

South block guest house Room	: INR 1200 per day
North block guest house Room	: INR 600 per day
Hostel Room	: INR 50 per day

## Resource Persons

Er. P. Mallick (Manager, HAL)  
 Mr. S. Sahoo (Gr. Capten, Aircraft-ISRO)  
 Prof. S. K. Sahoo (NIT Rourkela)  
 Prof. S. Narayan (IISc Bangalore)  
 Prof. Ajit Behera (NIT Rourkela)  
 Prof. Arpan Sahu (VIT Vellore)  
 Sct. R. Sahu (IMMT, Bhubaneswar)