

**Accommodation:**

On prior request, accommodation (twin sharing) may be provided to the participants in the institute guest house of NIT, Rourkela as per availability. No TA/DA will be provided to the participants.

**Important Dates:**

Last date of receipt of application form	14th Oct 2016
Notification to participants	17th Oct 2016
Course Commencement	24th Oct 2016

**Contact Details:**

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**Registration Form**

TEQIP-II Sponsored Workshop  
on

Hydroxyapatite for Orthopedic & Dental  
Implants by Ion Implantation Method

HODIIM-2016  
(24<sup>th</sup> - 25<sup>th</sup> October, 2016)

1. Name: \_\_\_\_\_
2. Sex (M/F): \_\_\_\_\_
3. Organization/Dept \_\_\_\_\_
4. Highest Academic Qualification: \_\_\_\_\_
5. Address of correspondence: \_\_\_\_\_
6. Research Interest \_\_\_\_\_
7. Accommodation Required: YES/NO \_\_\_\_\_

Phone/Mobile:  
Email:

**Declaration**

The information provided is true to the best of my knowledge. If selected, I agree to abide by the rules and regulations of the course. I also agree to inform the Coordinators in case, I am unable to attend the course.

Date: \_\_\_\_\_  
Place: \_\_\_\_\_ Signature of Participant

Forwarding remarks of Head of the Department/Institute.

Signature with seal

**TEQIP-II Sponsored**

Workshop on

Hydroxyapatite for Orthopedics & Dental  
Implants by Ion Implantation Method

HODIIM- 2016

(24<sup>th</sup> - 25<sup>th</sup> October, 2016)



Under Centre of Excellence Orthopaedic  
Tissue Engineering and Rehabilitations

Coordinator

**Prof S.Panigrahi**



Organized by  
**Department of Physics & Astronomy  
National Institute of Technology  
Rourkela-769008, Odisha, India**

### Scope & Course Objective:

Currently, there is a significant need for improved synthetic materials, for use as orthopaedic & dental implants, to replace human bone & teeth lost or damaged due to disease (e.g. osteoporosis) and/or injury. Implant materials for orthopaedics & dental applications are usually inserted in the human body for long periods of time. Therefore strict requirements are placed on durability in & affinity to the human body. Accordingly, implant materials should have good mechanical strength, high chemical stability, high corrosion resistance, very low toxicity & high biocompatibility. A number of techniques have been reported for synthesising calcium phosphate / hydroxyapatite coatings on metallic substrates, primarily for the purpose of enhancing osteoconductivity of bone or teeth - interfacing implants. Ion beam implantation of Calcium and Phosphorous on metal surface is one of the preferred choice.

### Topics to be covered:

- i) Composition of human bone and teeth (naturally formed hydroxyapatite)
- ii) Basic Physics & instrumentation behind Ion Implantation technique.
- iii) Clinical approach of implant materials. Orthopedic diseases like osteoarthritis, Knee joint etc.
- iv) Ion Implantations with special reference to Swift heavy ion Implantation.
- v) Characterizations by PIXE, EDXRF, XRD, TG- DTG and FTIR spectrometry.

### Key Resource Persons:

- Prof. S.Panigrahi, NIT, Rourkela
- Dr Sankarsan Patro MBBS, MD(Orthopedic Specialist, Govt City Hospital Berhampur)
- Prof D.Behera, NIT Rourkela.
- Dr T.R..Routray SOA University, BBSR
- Dr B.Mallick , Ion Beam Lab IOP, BBSR.

### Who can attend?

The workshop is multidisciplinary in origin. Faculties/scientific staffs of PG, depts. Universities & technical institutions that are work-ing or interested to work in the area of specified in the scope & objective are expected to attend. Number of participants is limited to 30.

### About National Institute of Technology, Rourkela:

National Institute of Technology (NIT), Rourkela was founded as Regional Engineering College, Rourkela in the year 1961. It is a prestigious Institute with a reputation for excellence at both undergraduate and postgraduate levels, fostering the spirit of national integration among the students, a close interaction with industry and a strong emphasis on research, both basic and applied.



Main entrance of NIT, Rourkela

The institute presently have 20 departments and 09 multi-disciplinary centers.

### Location:

The city of Rourkela is a bustling industrial town, cosmopolitan by nature and is well connected to all parts of the country by road and rail. It is en-route Howrah-Mumbai main line of South-Eastern Railway. Nesting

amidst greenery on all sides, NIT campus is approximately 7 km from Rourkela railway station. The nearest airports are Ranchi, Kolkata and Bhubaneswar, which are well connected by trains.

### About Dept. of Physics & Astronomy:

Department of Physics & Astronomy, NIT Rourkela is as old as the Institute itself (1965). To start with this department was regarded as a pioneer centre in the field of Small Angle X – ray scattering (SAXS). The department offer M.Sc,( Integrated and 02 years) M.Tech ( R) and Ph.D programme along with B.Tech programme. The teaching and research programme includes: Soft condensed matter Physics, Biophysics, Polymer composites, Nano materials, Dielectrics, Ferroelectrics, Magnetic and Multiferroic materials, Electro ceramics, Thin films, High temperature superconductors, Experimental Low temperature Physics, Accelerator based ion-matter interactions, Computational material science, and Non-linear dynamics.

The department is well equipped with many sophisticated instruments like XRD with Small angle X-ray scattering and thin film facility, Laser Light Scattering, Closed cycle He refrigerator, RF/DC magnetic sputtered thin film coating units, AC/DC resistivity measurement units, Precision Ferroelectric Characterization System, Impedence Analyzers, 1.4 Tesla electromagnet, CVD unit, AC-magnetic susceptibility measurement setup,

### Registration:

Registration Fee: **Free for all participants.** Course materials, food & refreshment will be provided. Subject to availability, free accommodation will be provided in the guest house.

### How to Apply:

Scanned copy of the duly filled and signed registration form approved by Head of Department or Head of Institution should be sent through mail to the coordinator on or be-fore 14th Oct 2016. Hard copy must be submitted in the registration desk on 24th Oct, 2016.