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:

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last date of receipt of application form</td>
<td>14th Oct 2016</td>
</tr>
<tr>
<td>Notification to participants</td>
<td>17th Oct 2016</td>
</tr>
<tr>
<td>Course Commencement</td>
<td>24th Oct 2016</td>
</tr>
</tbody>
</table>

Contact Details:

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Dept of Physics & Astronomy  
National Institute of Technology Rourkela-769008, Odisha, INDIA.  
Mob: 9437145313  
www.nitrkl.ac.in

Registration Form

TEQIP-II Sponsored Workshop on Hydroxyapatite for Orthopedic & Dental Implants by Ion Implantation Method  
HODIIIM-2016 (24th - 25th 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

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
**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 and affinity to the human body. Accordingly, implant materials should have good mechanical strength, high chemical stability, high corrosion resistance, very low toxicity, and 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 choices.

**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 working 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 Institution 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.

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**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.

**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 offers M.Sc.(Integrated and 2 years) M.Tech (R) and Ph.D programmes along with a 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.

**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.

**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 before 14th Oct 2016. Hard copy must be submitted in the registration desk on 24th Oct, 2016.