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Building and Works Committee
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Agricultural and Food Engineering
Architecture and Regional Planning
Biotechnology
Chemical Engineering
Chemistry
Civil Engineering
Computer Science and Engineering
Electrical Engineering
Electronics and Electrical Communication Engineering
Geology and Geophysics
Humanities and Social Sciences
Industrial Engineering and Management
Mathematics
Mechanical Engineering
Metallurgical and Materials Engineering
Mining Engineering
Ocean Engineering and Naval Architecture
Physics and Meteorology

Centers

Centre for Educational Technology
Centre for Oceans, Rivers, Atmosphere and Land Sciences
Cryogenic Engineering Centre
Materials Science Centre
Reliability Engineering Centre
Rubber Technology Centre
Rural Development

Schools

G. S. Sanyal School of Telecommunications
Rajendra Mishra School of Engineering Entrepreneurship
Rajiv Gandhi School of Intellectual Property Law
Ranbir & Chitra Gupta School of Infrastructure Design and Management
School of Information Technology
School of Medical Science & Technology
School of Water Resources
Vinod Gupta School of Management
PART–II

Centralised Services, Programmes and Units

Advanced Technology Development Centre
Alumni Affairs & International Relations
Central Library
Central Research Facility
Central Workshop & Instruments Service Section
Centre for Theoretical Studies
Computer and Informatics Centre
Continuing Education Centre
Estate (E&M) Works Section
Estate Civil Head Office
Extra Academic Activities
Information Cell
Kalpana Chawla Space Technology Cell
Rajbhasha Vibhag
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Sponsored Research and Industrial Consultancy
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Financial Information
Members of the Council of Indian Institutes of Technology

1. Dr. M. Mangapati Pallam Raju  
   Hon'ble Minister of Human Resource Development

2. Shri Deepender Singh Hooda  
   Hon'ble Member of Parliament (Lok Sabha)

3. Shri Janardhana Swamy  
   Hon'ble Member of Parliament (Lok Sabha)

4. Smt. Vasanthi Stanley  
   Hon'ble Member of Parliament (Rajya Sabha)

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   Indian Institute of Technology, Bombay

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   Indian Institute of Technology, Delhi

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Indian Institute of Technology, Jodhpur

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Indian Institute of Technology, Mandi

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Indian Institute of Technology, Ropar

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Indian Institute of Technology (BHU), Varanasi

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Director, Indian Institute of Technology, Bombay

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Director, Indian Institute of Technology, Delhi

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Director, Indian Institute of Technology, Kanpur

23. Prof. P. P. Chakrabarti  
Director, Indian Institute of Technology, Kharagpur

24. Prof. Bhaskar Ramamurthi  
Director, Indian Institute of Technology, Madras

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Director, Indian Institute of Technology, Guwahati

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41. Shri J Satyanarayana,
    Secretary, Department of Information Technology

42. Dr. S.S. Mantha,
    Chairman (Acting), All India Council for Technical Education
<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Name &amp; Address</th>
<th>Position</th>
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</table>
| 1.    | Dr. Shiv Nadar  
Chairman, BoG, IIT Kharagpur & Founder- HCL Technologies Ltd.  
A-10/11, Sector-3, Noida-201301, U.P. | Chairman          |
| 2.    | Secretary(HE)  
Ministry of Human Resource Development  
Department of Higher Education  
Shastri Bhawan, New Delhi -110115 | Member            |
| 3.    | Dr. Srikumar Banerjee  
Bhabha Atomic Research Centre, Trombay  
Mumbai – 400085 | Member            |
| 4.    | Prof. B. B. Bhattacharya  
Professor of Economics  
A-44, Sarve Sanjhi Apts.  
Plot No.8, Sector-9, Dwarka, New Delhi-110077 | Member            |
| 5.    | Shri Sandipan Chakravortty  
Managing Director  
Tata Steel Processing & Distribution Limited  
Tata Centre (Ground Floor),  
43, Chowringhee Road, Kolkata – 700071 | Member            |
| 6.    | Prof. N. Balakrishnan  
Associate Director  
Indian Institute of Science, Bangalore – 560012 | Member            |
| 7.    | Shri Tamal Dasgupta  
A-3, Royal Greens  
49/1, PGM Shah Road  
Golf Garden, Kolkata – 700033 | Member            |
| 8.    | Prof. D. Acharya  
Director (upto 30.06.2012)  
Director (Officiating) (upto 30.09.2012)  
IIT Kharagpur | Member            |
| 9.    | Prof. S. K. Som  
Director (Officiating) ( from 01.10.2012)  
IIT Kharagpur | Member            |
| 10.   | Prof. N. R. Mandal  
Dept. of Ocean Engg. & Naval Architecture  
IIT Kharagpur | Member            |
| 11.   | Prof. S. K. Satsangi  
Dept. of Ocean Engg. & Naval Architecture  
IIT Kharagpur | Member            |
| 12.   | Dr. T.K. Ghosal  
Registrar (Officiating) (upto 13.12.2012)  
Registrar (from 14.12.2012)  
IIT Kharagpur | Secretary         |
<table>
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<tr>
<td>1.</td>
<td>Shri Shiv Nadar</td>
<td>Chairman</td>
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<td></td>
<td>Chairman, BoG, IIT Kharagpur &amp; Founder- HCL, HCL Technologies Ltd. A-10/11, Sector-3, Noida-201301, U.P.</td>
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<tr>
<td>2.</td>
<td>Secretary(HE)</td>
<td>Member</td>
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<td>3.</td>
<td>Additional Secretary &amp; Financial Adviser (upto 04.03.2013)</td>
<td>Member</td>
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<td>Joint Secretary &amp; Financial Adviser (from 05.03.2013)</td>
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<td>Shri Tamal Dasgupta</td>
<td>Member</td>
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<td>6.</td>
<td>Prof. D. Acharya</td>
<td>Member</td>
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<td>8.</td>
<td>Prof. S. K. Som (from 01.10.2012)</td>
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<td>9.</td>
<td>Prof. S. K. Satsangi</td>
<td>Member</td>
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<td>10.</td>
<td>Dr. T.K. Ghosal</td>
<td>Secretary</td>
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<td>Registrar (Officiating) (upto 13.12.2012)</td>
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<td>IIT Kharagpur</td>
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# Building and Works Committee

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<tr>
<th>Sl. No</th>
<th>Name &amp; Address</th>
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</table>
| 1.     | Prof. D. Acharya  
Director ( upto 30.06.2012)  
Director (Officiating) ( upto 30.09.2012)  
IIT Kharagpur | Chairman |
| 3.     | Prof. S. K. Som  
Director (Officiating)  
IIT Kharagpur | Chairman |
| 4.     | Shri S. K. Biswas  
Superintending Engineer & Circle Manager  
Midnapore Distribution Circle  
West Bengal State Electricity Distribution Co. Ltd. (WBSEDCL)  
190, S. K. Bose Road  
Paschim Medinipur  
PIN - 721101 | Member |
| 5.     | Shri Swadesh Kumar Chakraborty  
Superintending Engineer  
South Western Circle  
Public Works Department (PWD)  
Saheed Mangal Pandey Sarani  
Paschim Medinipur  
PIN - 721101 | Member |
| 6.     | Head  
Department of Civil Engineering  
IIT Kharagpur | Member |
| 7.     | Head  
Department of Electrical Engineering  
IIT Kharagpur | Member |
| 8.     | Head  
Dept. of Architecture & Regional Planning  
IIT Kharagpur | Member |
| 9.     | Registrar  
IIT Kharagpur | Secretary |
Administrative Heads

Director
Prof. Damodar Acharya (up to 30.06.2012)

Director (Officiating)
Prof. Damodar Acharya (from 01.07.2012 up to 30.09.2012)
Prof. S. K. Som (From 01.10.2012)

Deputy Director
Prof. A.K. Majumdar

Registrar (Officiating)
Dr. T.K. Ghosal (Up to 13.12.2012)
Registrar
Dr. T.K. Ghosal (From 13.12.2012)

Deans
Undergraduate Studies
Prof. S. K. Som
Prof. Somnath Sengupta (Upto 20.12.2012)

Postgraduate Studies & Research
Prof. A. N. Samanta

Faculty
Prof. Amit Basak
Planning & Coordination
Prof. B. K. Mathur
Sponsored Research & Industrial Consultancy
Prof. P. P. Chakrabarti

Students’ Affair
Prof. N. R. Mondal
Continuing Education
Prof. Somnath Sengupta
Alumni Affairs & International Relations
Prof. Amit Patra

Vinod Gupta School of Management
Prof. K. K. Guin (Acting)

Head of Departments
Aerospace Engineering
Prof. K. P. Sinha mahapatra
Agricultural & Food Engineering
Prof. P. B. S. Bhadoria
Architecture & Regional Planning
Prof. Jaydip Barman
Biotechnology
Prof. T. K. Maiti (From 01.01.2013)
Chemical Engineering
Prof. N. C. Pradhan
Chemistry
Prof. D. R. Mal
Civil Engineering
Prof. L.S. Ramachandra (Upto 31.12.2012)
Prof. Subhasis Dey (From 01.01.2013)
Computer Science & Engineering
Prof. Jayanta Mukhopadhyay
Electrical Engineering
Prof. Jayanta Pal
Electronics & Electrical
Prof. C.K. Maiti (Upto 15.06.2012)
Communication Engineering
Prof. Swapna Banerjee (From 16.06.2012)
Geology & Geophysics
Prof. Biswajit Mishra (Upto 31.12.2012)
Prof. Debashish Sengupta (From 01.01.2013)
Humanities & Social Sciences
Prof. K. B. L. Srivastava
Industrial Engineering & Management
Prof. B. Mohanty (Upto 31.12.2012)
Prof. M. K. Tiwari (From 01.01.2013)
Mathematics
Prof. P. D. Srivastava
Mechanical Engineering
Prof. Ranjan Bhattacharyya
Metallurgical & Materials Engineering  
Prof. Siddhartha Das  
Minning Engineering  
Prof. K. U. M. Rao  
Ocean Engineering & Naval Architecture  
Prof. O. P. Sha  
Physics & Meteorology  
Prof. S. K. Ray

**Head of Centers**

Advanced Technology Development Centre  
Prof. P. P. Chakrabarti  
Centre for Educational Technology  
Dr. Bani Bhattacharyya  
Centre for Oceans, Rivers, Atmosphere and Land Sciences  
Prof. D. Sen  
Cryogenic Engineering  
Prof. V. V. Rao  
Prof. Kanchan Chowdhury  
From 01.01.2013  
Material Science  
Prof. S. Ram  
Reliability Engineering  
Prof. B. Mohanty  
Prof. M. K. Tiwari  
From 01.01.2013  
Rubber Technology  
Prof. G. B. Nando  
Rural Development  
Prof. P. B. S. Bhadoria  
Computer & Informatics  
Prof. Prabir Kumar Biswas  
Administrative Computer Service Support Centre  
Prof. R.N. Banerjee

**Head of Schools**

G. S. Sanyal School of Telecommunications  
Prof. Saswat Chakrabarti  
School of Information Technology  
Prof. Jayanta Mukhopadhyay  
School of Medical Science & Technology  
Prof. Pranab Kumar Dutta  
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Prof. K. K. Guin  
Rajendra Mishra School of Engineering Entrepreneurship  
Prof. D. Biswas  
Rajiv Gandhi School of Intellectual Property Law  
Prof. S. V. Joga Rao  
Prof. M. Padmavati  
Prof. K. Vibhute  
From 04.03.2013  
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Prof. U. K. Banerjee  
School of Water Resources  
Prof. S. N. Panda

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Vice-Chairman, UG Admissions  
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Prof. S. K. Pal  
PG Admissions  
Prof. D. Deb  
Vice-Chairman, PG Admissions  
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Prof. S. Sahu  
Hall Management Committee  
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CRF (Life Science Division): Prof. A. K. Ghosh
Rajbhasha Vibhag: Prof. U. C. Gupta
Nehru Museum of Science & Technology: Prof. D. Sen
Kalpana Chawla Space Technology Cell (KCSTC): Prof. Somnath Sengupta

Professors-in-Charge

B C Roy Technology Hospital: Prof. Chhanda Chakrabarti
Examinations: Prof. Biswajit Maiti
Training & Placement: Prof. Sudhir Kumar Barai
General Time Table: Prof. D. K. Pratihar
Convocation-2012: Prof. S. K. Som
Institute Information Cell: Prof. B. K. Mathur
President, Technology Students Gymkhana: Prof. Manish Bhattacharjee
Refrigeration & Air Conditioning: Prof. M. Ramgopal
Horticulture: Prof. C. K. Mukherjee
Water Works: Prof. A. K. Gupta
Civil Works (Construction and Maintenance): Prof. N. Dhang
Electrical Works: Prof. D. Das
Telecommunication: Prof. Raja Datta
Institute Guest Houses: Prof. B. K. Sengupta
Intellectual Property Right & Industrial Relation: Prof. S. K. Barai

General

Librarian: Dr. B. Sutradhar
Public Information Officer: Dr. Anathbandhu Patra
Head, B.C. Roy Technology Hospital: Dr. B. Mishra
Superintending Engineer (Civil): Shri T. K. Mukherjee
Executive Engineer (Civil): Shri Subrat Roy (on EOL)
Executive Engineer (Civil): Shri S. K. Biswas
Executive Engineer (Electrical): Shri Sabyasachi Ghosh
Security Officer: Shri R. N. Senapati

Superintending Engineer (Civil): Shri T. K. Mukherjee
Executive Engineer (Civil): Shri Subrat Roy (on EOL)
Executive Engineer (Civil): Shri S. K. Biswas
Executive Engineer (Electrical): Shri Sabyasachi Ghosh
Security Officer: Shri R. N. Senapati
List of Senate Members

Chairman
Prof. D. Acharya
Director (up to 30.06.2012)
Director (Officiating) (from 01.07.2012 up to 30.09.2012)

Prof. S. K. Som
Director (Officiating) (from 01.10.2012)

Members

Aerospace Engineering
Prof. P.K. Datta
Prof. N. Singh
Prof. K. P. Sinhamahapatra
Prof. B. N. Singh

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Prof. B.C. Mal
Prof. R. Singh
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Prof. H. Raheman
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Prof. G. Kundu

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Prof. A.K. Ghosh
Prof. A.K. Das
Prof. T. K. Maiti
Prof. S. K. Ghosh

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Prof. P.K. Chattaraj
Prof. T. Pathak
Prof. T. S. Pal
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Prof. D. Ray
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Prof. S. Bandopadhyay
Prof. S. Hajra
Prof. J. K. Dey
Prof. P. Pramanik

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Prof. N. Dhang
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Prof. A. Gupta
Prof. P. P. Das

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Prof. V. Rao Vutukuru
Prof. K. Chowdhury

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Prof. N.K. Kishore
Prof. A. Barua
Prof. G. Ray
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Prof. S. Sen
Prof. P.K. Dutta
Prof. B.M. Mohan
Prof. D. Das
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Prof. T. K. Bhattacharya
Prof. C. Chakraborty
Prof. S. Maka
Prof. A. K. Pradhan
Prof. D. Kastha
Prof. A. Routray

G S Sanyal School of Telecommunication
Prof. S. Chakraborti

Geology & Geophysics
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Prof. B. Mishra
Prof. A.K. Gupta
Prof. D. Sengupta
Prof. A. Bhattacharya
Prof. S. Tripathy
Prof. A. Sarkar
Prof. S. Das
Prof. M. K. Panigrahi
Prof. S. K. Bhowmik
Prof. S. Gupta
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Prof. M. A Mamanti

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Prof. Ajoy Kr. Roy

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Prof. V. N. Giri
Prof. C. Chakraborti
Prof. P. Patnaik

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Prof. P.K.J. Mohapatra
Prof. R.N. Banerjee
Prof. D. Acharya
Prof. B. Mohanty
Prof. P.K. Ray
Prof. M. K. Tiwari
Prof. P. L. Narasimhan

Materials Science
Prof. D. Bhattacharyya  
Prof. C.K. Das  
Prof. B. Adhikari  
Prof. S. Ram  
Prof. S. Banerjee  

Mathematics  
Prof. A. R. Roy  
Prof. P.D. Srivastava  
Prof. A. Sarkar  
Prof. U.C. Gupta  
Prof. M.P. Biswal  
Prof. D.K. Gupta  
Prof. V. K. Jain  
Prof. S. Bhattacharyya  
Prof. A. Goswami  
Prof. S. Kumar  
Prof. R. K. Pandey  
Prof. G. P. Raja Sekhar  

Mechanical Engineering  
Prof. B. Maiti  
Prof. A. Mukherjee  
Prof. S.K. Som  
Prof. V.V. Satyamurty  
Prof. A. K. Chattopadhyay  
Prof. S. Bhattacharyya  
Prof. R. Bhattacharyya  
Prof. S. K.Dash  
Prof. P. K. Das  
Prof. A. R. Mohanty  
Prof. S. N. Bhattacharyya  
Prof. R. N. Maiti  
Prof. S. Paul  
Prof. M. C. Ray  
Prof. A. K. Nath  
Prof. S. Roy  
Prof. D. K. Prathihar  
Prof. S. Chakraborty  
Prof. A. Dasgupta  
Prof. A. Guha  
Prof. S. K. Roy Chowdhury  
Prof. M. Ramgopal  
Prof. A. Roy Choudhury  

Metallurgical & Materials Engineering  
Prof. M. Chakraborty  
Prof. S. K. Pabi  
Prof. M.M. Godkhindi  
Prof. K.K. Ray  
Prof. N.Chakraborty  
Prof. I. Manna  
Prof. S. Das  
Prof. S. K. Roy  
Prof. K. Das  
Prof. G. G. Roy  
Prof. R. Mitra  
Prof. P.K. Sen  
Prof. J. Dutta Majumdar  

Prof. S. B. Singh  

Mining Engineering  
Prof. S.S. Bhamidipati  
Prof. A. Bhattacharyya  
Prof. K. U. M. Rao  
Prof. S. K. Das  
Prof. K. Pathak  
Prof. J. Bhattacharyya  
Prof. S. K. Mukhopadhyay  
Prof. S. K. Pal  
Prof. D. Deb  

Ocean Engineering & Naval Architecture  
Prof. S.C. Misra  
Prof. S.K. Satsangi  
Prof. N.R. Mandal  
Prof. D. Sen  
Prof. O. P. Sha  
Prof. Trilochan Sahoo  

Physics & Meteorology  
Prof. B.K. Mathur  
Prof. S.L. Sharma  
Prof. S.K. Ray  
Prof. A. Taraphder  
Prof. K. Kumar  
Prof. S. Bharadwaj  
Prof. S. Kar  
Prof. A. Roy  
Prof. P. K. Datta  

Rajiv Gandhi School of Intellectual Property Law  
Prof. Khushal Vibhute,  

Reliability Engineering  
Prof. V.N.A. Naikan  

Rubber Technology  
Prof. A.K. Bhowmick  
Prof. G.B. Nando  
Prof. D. Kastigar  
Prof. T. K. Chaki  

School Of Information Technology  
Prof. S. Sural  

School of Medical Science & Technology  
Prof. S. K. Guha  
Prof. A. K. Bardhan  

Steel Technology Centre  
Prof. R. N. Ghosh  

Vinod Gupta School Of Management  
Prof. K. K. Guin,  
Prof. G. Sinha  
Prof. P. Mukherjee  
Prof. Prabina Rajib
Librarian
Dr. B. Sutradhar,

Students Representative

Vice President: Mr. Rinshul Chandra
UG representative: Mohammed Janipasha
PG Representative: Mr. Anshu Bansal
Research Scholar representative: Mr. Jose Gilbert J

Secretary
Registrar: Dr. T. K. Ghosal
DIRECTOR’S REPORT

IIT Kharagpur continued taking new strides towards emerging directions to further the growth and dissemination of scientific and technological knowledge during the year 2012-2013. Brief outlines of the major activities of the Institute during this period are highlighted.

ACADEMIC PROGRAMMES

The Institute has been very sensitive to the human resource development of the country and to that end continues initiating new academic programs. In recent years we have introduced several new academic programmes. These include:

- **M. Arch**: Master of Architecture in Sustainable Built Environments is being taken up in the Department of Architecture and Regional Planning
- **Dual-degree programme on Quality Engineering design and Manufacturing** coordinated by the Department of Industrial Engineering and Management
- **M. Tech programme on Embedded Software and Control** coordinated by the Advanced Technology Development Centre
- **M. Tech. Programme in Water Management** in School of Water Resources.
- **M.Tech in Infrastructure Design and Management** in the Ranbir and Chitra Gupta School of Infrastructure Design and Management.
- **M.Tech in Media and Sound Engineering** in Centre for Education Technology
- **Introduction of a specialized M. Tech. programme on Telecommunication Network Engineering** in the GS Sanyal School of Telecommunication.
- **The Department of Mathematics is in the process of reviewing its already existing programs** though a change of course content of different topics as per the present day requirements
- **A new Programme in the area of Marine Resource Development and Management** is being launched in the Centre for Ocean, River, Atmosphere and Land Sciences
- **Dual Degree Postgraduate programme in Financial Engineering** involving various departments.
- **3-Year Executive MBA (EMBA) Programme** in Kolkata and Bhubaneswar Campus introduced by the Vinod Gupta School of Management.

The Institute is presently offering B.Tech (Hons) programmes in seventeen different branches of engineering, a B.Arch. (Hons.) programme in Architecture, fifteen Dual Degree programmes, seven Integrated M.Sc. programmes, four two-year Joint M.Sc.-Ph.D. programmes, fiftythree postgraduate degree programmes leading to Joint M.Tech. / MCP-Ph.D., MBM, MHRM and MMST degrees besides an LLB degree. The curricula and syllabi of these programmes are constantly updated to meet the needs of the changing world with focus on quality and excellence.

A noteworthy recent addition is the implementation of the ERP System. All academic issues including faculty recruitment, student’s registration, enrollment, course allocation, examination results, students feedback and sponsored project details are now available on-line through this system.

Today, at this function we will be conferring 149 Ph.D., 25 MS, 771 M.Tech., 32 MCP, 123 MBA, 4 MMST, 17 MHRM, 27 LLB, 270 Dual Degree, 472 B.Tech. (Hons.), 20 B.Arch. (Hons.) and 228 M.Sc. degrees.

58th Convocation

Fifty-eighth Annual Convocation of the Institute was held on September 15, 2012. Shri Pranab Mukherjee, President of India was the Chief Guest. The convocation conferred degrees to 2049 graduates that include 1 D.Sc., 181 Ph.D., 46 MS, 696 M.Tech., 32 MCP, 84 MBA, 11 MMST, 19 MHRM, 28 LLB, 283 Dual Degree, 416 B.Tech. (Hons.), 22 B.Arch. (Hons.) and 230 M.Sc. degrees. Following students were the recipients of Institute Gold Medals for their academic excellence and all round performance in the year 2011-2012.
• Shri Avishek Biswas of the Department of Electronics and Electrical Communication Engineering received the **President of India Gold Medal** for the best academic performance among the outgoing B.Tech. (Hons.) and B.Arch.(Hons.) students.

• Shri Devesh Kumar Dhruw of the Department of Electrical Engineering won the **Dr. Bidhan Chandra Roy Memorial Gold Medal** for the best all-round performance among the B.Tech. (Hons.) and B.Arch.(Hons.) outgoing students.

• The **Prime Minister of India Gold Medal** for the best academic performance among the Dual degree and Integrated M.Sc. outgoing students went to Shri Vighnesh Avadhani of the Department of Computer Science and Engineering.

• **Dr. Jnan Chandra Ghosh Memorial Gold Medal** for the best all-round performance among the outgoing Dual Degree and Integrated M.Sc. students was awarded to Shri Chirag Fialoke of the Department of Mechanical Engineering.

• Shri Pratish Datta of the Department of Mathematics won the **Professor Jagadish Chandra Bose Memorial Gold Medal** for the best academic performance among the outgoing students of all 2-year M.Sc. courses in the Science Disciplines.

• Ms. Vinnakota L.B.K.Manjula of the Department of Electronics and Electrical Communication Engineering received **The Director’s Gold Medal** for the best academic performance among the students completing M.Tech and MCP courses.

The Senate and the Board of Governors of the Institute conferred the highest honor, the degree of Doctor of Science (Honoris Causa), on the following distinguished personalities:

• Mr. Arjun Malhotra in recognition of being a doyen of the Indian Computer Industries and chief architect in setting up HCL.

• Mr. B. Muthuraman for his visionary leadership in making Tata Steel to become a truly global company.

• Mr. Baba Neelkanth Kalyani for being the global leader in automotive forging industry.

• Professor M. M. Sharma who has been acclaimed world wide as an outstanding Chemical Engineer and is regarded as a scientist of rare distinction.

In the convocation the **Distinguished Alumnus Award** were conferred on:

• Prof. Sanjoy Banerjee, CUNY Distinguished Professor of Chemical Engineering and Director of the Energy Institute, which he founded when he moved to the City College of New York.

• Prof. Pinakpani Chakrabarti, Senior Professor at Bose Institute and is known nationally and internationally for his work in structural biology and bioinformatics.

• Mr. Sandipan Chakravorty, Managing Director of Tata Steel Processing and Distribution Limited (formerly Tata Ryerson Limited).

• Dr. Anand Deshpande, Founder, Chairman and Managing Director of Persistent Systems.

• Dr. Supratik Guha, is the Director of the Physical Sciences Department at IBM Research and is responsible for managing IBM’s worldwide research in the physical sciences,

• Prof. Farrokh Mistree, who holds the L.A. Comp Chair and is the Director of the School of Aerospace and Mechanical Engineering at the University of Oklahoma in Norman, Oklahoma,

• Prof. Viswanath Ramamurti, a rare case of an academician with a flare of solving design problems of industry,

• Mr. Dipankar Raychowdhuri, Professor Electrical and Computer Engineering and Director, WINLAB (Wireless Information Network Lab) at Rutgers University,

• Mr. Ved Prakash Sandlas, the Director General, Amity Institute of Aerospace Engineering, Noida,

• Mr. Pronob Kumar Sandell, internationally recognized expert in the metallurgical industries. He is the first Vice President of the student’s Gymkhana at IIT, Kharagpur.
• Prof. Subrata Sengupta, Dean of the College of Engineering and Computer Science at the University of Michigan-Dearborn,
• Dr. Puthenveetil C. Varghese, one of the gems of Structural Engineering.

Research and Development Activities

• **Aerospace Engineering**: Department is involved in various research activities in different fields namely; Composite & Smart Structures, Structural Dynamics & Aeroelasticity, Design & Development of MR-fluid damper. Analysis of aerospace Structures using DQM, DTFM, FEM. Nanomaterials and nanomechanics. Development of reconfigurable autonomous air vehicle. Lunar gravity modeling, topography modeling and orbit determination for the Chandrayaan-I. Fault tolerant and reconfigurable architecture development for the automotive. Real time system identification, system identification using neural sensitivity analysis. Fault detection and identification for aircraft.

• **Agricultural and Food Engineering**: Application of GIS in both command area and watershed management, Neural network in hydrology, Ballast management of agricultural tractors, Biofiltration Technology, Bio-fuels from tree-based oils, Climate change analysis and applications in water and crop management, Design, development and field evaluation of a small power tractor, Design and development of slip meter for two-wheel drive tractors.


• **Biotechnology**: Production of an anti-tumor biosurfactant, Alkaline lipase, Biodiesel; Bioreactor strategies for the enhanced production of probiotic endospores for Nutraceutical formulations and their clinical evaluation; Molecular characterization of metronidazole activation and deactivation pathways in *Entamoeba histolytica*; Structural and functional studies of protein from *M. tuberculosis* and *S. aureus* aiming at drug and inhibitor design; Biomicrofluidics and Biochip development, Microbial fuel cell. Molecular cloning, expression and characterization of E. invadens encystation specific proteins. Improvement of hydrogen production from industrial waste using hybrid bioreactor. Characterization of Antarctic microbota Probiotic nutraceutical development.

• **Chemical Engineering**: Advanced separation processes involving membranes with emphasis on water purification, dye removal, effluent treatment, etc.; Development of innovative catalysts from fly ash for organic chemical synthesis (alkylation, isomerisation etc.); Plasma assisted surface modification for chemical engineering applications; Heterogeneous reactions with application to chemical process development; Utilization of non-edible oils for manufacturing of value-added chemicals; Steam reforming of petroleum feedstock in mini-and micro-reactors for production of hydrogen.

• **Chemistry**: Synthesis of bioactive natural products, Isolation and characterization of an angiogenic protein; Supramolecular chemistry; Development of highly selective and green methodologies; Development integrated biosensing platform for clinical and environmental applications; electron transfer processes with emphasis in dioxygen chemistry; Micellar, zeolite, and bimetallic catalysts, aqueous medium polymerization; metal nanoparticles, nanocrystalline ferrites, ceramics and composites; Materials for high temperature and superconducting applications.

• **Civil Engineering**: Cell filled low cost rural roads, Analysis and Evaluation of Concrete and flexible pavements, Specifications for bituminous mixes and Urban transportation planning; Microbial Fuel Cells, Onsite treatment of domestic sewage from small community, Studies on granulation in
UASB reactor treating low strength wastewater to enhance efficiency of the reactor, Water quality and health assessment, Nanoparticle synthesis, their characterization and application; Photodegradation of organic pollutants; Removal of Arsenic from ground water using low cost adsorbent; Erosion control and mechanical stabilization of soils using natural fibers, ground improvement, soil-microbe interaction, in situ testing, geotechnical earthquake engineering, landslides and slope stabilization


- **Electronics and Electrical Communication Engineering**: Design and development of an embedded system-on-chip solution for an adaptive intelligent biomedical system, low cost Doppler Ultrasonography system, design of an Ultrasound Imaging system, development of non-invasive blood glucose monitor based on laser induced photo acoustic spectroscopy, early detection of oral cancer via image processing. Fibre Optics and Networking: The current research involves dispersion compensation of 40 Gb/s optical transmission system with optical phase conjugation and distributed Raman amplifier as well as with chirped fibre Bragg grating. In the optical networking area, innovative schemes have been developed for guaranteeing WDM network survivability and IP-over-WDM integrated routing. Development of a RISC DSP for Modems. Development of a dual standard baseband processor for 3G Wireless Systems. Automated Visual Inspection of Industrial Objects, VLSI Architecture for low bit rate Video Coding, Medical Image Processing, Gesture Recognition from Video Sequences, Face recognition, Content based Retrieval of Texture Images, Fuzzy Neural Network. Automated Visual Inspection of Industrial Objects, VLSI Architecture for low bit rate Video Coding, Medical Image Processing, Gesture Recognition from Video Sequences, Face recognition, Content based Retrieval of Texture Images, Fuzzy Neural Network.

- **Geology and Geophysics**: Tectonic evolution of craton – mobile belt ensembles in parts of the Indian shield; Gold mineralization in greenstone belts of Dharwar Craton; Metamorphic remobilization of massive sulphide deposits; Studies on Indian microvertebrates, Lithospheric structure across Himalaya, Deformation at Collisional boundaries, Stable isotopes in Himalayan foreland sediments; Paleogene climate of Kutch, Rajasthan, Seismic Hazard assessment and microzonation in the NE India and metropolitan cities; Studies on Indian monsoon and paleoclimate studies of the Indian subcontinent and paleoceanography of the Indian Ocean.

- **Humanities and Social Sciences**: Quantitative economics, Financial economics, Economics of growth, Industrial economics, Development economics, Environmental and resource economics, Sociology of health and medicine, Brain and behavior, Visual aesthetics, Business ethics, corporate social responsibility.

• **Mathematics**: Fuzzy Mathematics, Soft Algebra, Bio Mechanics, Clifford Analysis, Dynamics of Nonlinear systems, Inventory Management, Graph Theory, Integral Equations, Cryptography, Queueing Theory, Statistical Decision Theory, Statistical Data Analysis, Compiler Design, Combinatorics, Fractional Calculus, Optimization and Theoretical Computer Science; Information and coding Theory; Cryptology.

• **Mechanical Engineering**: Design and development of expert systems in robotics, manufacturing science, medical diagnosis and others using soft computing; Bio-micro-fluidics and microscale transport processes, Transport Phenomena in Phase Change Problems; Laser materials Processing; CFD/Lattice Bolzmann Method in Complex Flows; Rotor dynamics and dynamics of lubricated ball bearings; Numerical simulation on two phase flow pertaining to bottom injected gas stirred ladles; Multi Layer TiN-MoS2 coating on cutting tools by unbalanced magnetron technique; Machinability study of Inconel 718; Development of control strategies for autonomous underwater vehicles; Model based fault detection and isolation; Simulation of liquid sloshing in a tank using numerical grid generation techniques; Prediction of fluid flow and heat transfer from wavy surfaces; Design and development of carbon di-oxide based heat pump systems; Vehicle system dynamics; Vibration Analysis Based Machine Fault Diagnostics.

• **Metallurgical and Materials Engineering**: Extractive Metallurgy, Mechanical Metallurgy, Melting, Casting and Solidification Processing, Modeling, Simulation and Multimedia in Metallurgical Engineering, Physical Metallurgy, Powder Metallurgy, Corrosion Science and Technology, Surface Engineering, genetic algorithm for the optimization of metallurgical systems, mathematical simulation of high temperature metallurgical systems by application of computational fluid dynamics, heat and mass transfer, molecular dynamic simulation of nanostructured materials, Development of Lithium Ion Battery (LIB) Technology for applications in Electric Vehicles in India.

• **Mining Engineering**: Environment and Safety- Application of LCA, GIS and remote sensing for soil and water analysis as a part of mine closure planning; Experimental and computational fluid dynamics studies for shock loss determination in mine air flow; Biological and passive treatment of mine waste water; Investigation of soil and water contamination vis-à-vis land use changes near mining fields. Study of human behaviour related accidents in mines, Rock Mechanics / Ground Control- Finite element analysis for longwall strata control problems, and design of shield supports; Assessment of Fly ash composites as a substitute fill material for underground mine voids; Risk analysis for the safety management of coalmines; Mine Planning / Modeling; Integration of GPS and ISAR ground deformation data over mining areas. Use of lasers for assessment of stability of dumps. Vision based semi-automatic mine navigation system.


Centre for Educational Technology: National Program on Technology Enhanced Learning - CET, IIT Kharagpur has already developed 186 courses (7,440 hours of video courses) as a part of NPTEL phase I & II which are available in the LAN for internal feedback. Development of suitable pedagogical methods for various classes, intellectual calibers and research in e-learning. 90 courses have been completed in the pilot phase. These courses consist detailed curriculum documents for each course with instructional objectives, assessment and references to learning resource materials. Creation of Integrated Development Environment (IDE) for Generation of Pronunciation Lexicon for Indian Languages (PL-IL) in W3C Pronunciation Lexicon Standard (PLS) and Example lexicon in Hindi and Bangla Languages.

Centre for Ocean, Rivers, Atmosphere and Land Sciences: The CORAL center is actively participating in DST/MOES sponsored STORM (Severe Thunderstorms and Regional Modeling) which is in operation along East/North East part of India. Under this program a 50 m instrumented micro-meteorological tower was installed in IIT Kharagpur campus to monitor the atmospheric surface layer characteristics during the pre-monsoon thunderstorm activity. A state of art upper air sounding system was procured to study the atmospheric boundary layer dynamics during various epochs of thunderstorm activities at Kharagpur. These systems are actively used in STORM programme as well as CTCZ experimental programme. The centre is also involved in the development of Data Assimilative Coastal Circulation Model Over Bay of Bengal; development of a Hybrid Coordinate Ocean Model (HYCOM) for the Bay of Bengal; numerical simulation of Bay-of-Bengal Circulation Features using satellite data; air-sea interaction studies, sea ice monitoring using remote sensing and satellite data obtained from Megha-Tropiques and to study any climate signal in their variation.

Cryogenic Engineering Centre: Cryogenic Engineering Centre is engaged in teaching at UG and PG levels, sponsored research and consultancy remain at the core activity of the Centre. The Centre is also active in Continuing Education through training engineers from industries, faculty from academic institutions, and scientists from R&D organisations by conducting short term courses and workshops in specialised areas like Cryogenic Engineering, Air Seapartio, Vacuum Technology etc.

Materials Science Centre: Novel polymers, ceramics and semiconductor materials supported by our Institute as well as by various funding agencies. In the area of polymer materials besides polymer modification we synthesize new polymers for application as electronic materials, membranes for gas separation, nanoclay and carbon nanotube reinforced composites for automobiles and other high performance speciality applications. welding thermoplastics, recycling waste polymers and direct fluorination of polymers. synthesis of nano-crystalline shape memory materials for biomedical applications, nano-fluids, nano ceramics for drug delivery, nano-structured oxides for ceramic gas sensor and cathode materials for lithium rechargeable batteries. We are also actively involved in the research on ferroic and multiferroic thin/thick films, sensors magnetic and magnetocaloric materials. Novel inorganic and organic semiconductor materials are being synthesized and characterized for various electronic and optoelectronic applications. MOCVD growth of InGaP epitaxial layers as well as quantum dots are also being carried out for various applications such as solar cell, etc. Another important area of research is the synthesis and characterization of wide band gap materials like SiC, ZnO and nitride semiconductors and nano materials for device applications. Multiwall carbon nanotubes are also being synthesized by CVD on silicon substrates.

Reliability Engineering Centre: The Centre is developing a Virtual Lab on fault Diagnosis of Rotary Systems. This lab will be useful for virtually creating certain faults in rotating systems and then diagnose the fault and its severity. The centre is also developing a remote monitoring system for fault diagnosis of industrial system which can be used for e-maintenance. Other activities include organizing short term courses on latest topics of Reliability Engineering for officers and engineers of the Industry, Defense Organizations and R & D Establishments. safety and reliability studies of nuclear power plants and missile systems are other activities.

Rubber Technology Centre: Polymer composites and nanocomposites Chemical modification of rubbers, Thermoplastic elastomers based on novel blends and alloys, Recycling of rubber waste Ionomers, Conductive rubber composites for electrical and electronics application, Electron beam modification of polymers. Rheology and processability of rubber compounds and polymer blends, Polymer foam and microcellular rubber composite for various critical and industrial applications. Development of rubber blends and composites for different industrial application like cable, oil seal, tank track pad, vibration isolators, high voltage insulators Development of adhesives.
and coatings. Development of biodegradable polymer and recycling of rubber and polymer. Controlled radical polymerization, Development of polymers for, biomedical application, electronic application. Centre will initiate two research projects under Centre for Railway Research (CRR), IIT Kharagpur.

- **Rural Development Centre**: Essential oil production technology, Fish feed production from non-conventional biological sources, Farm level technology for processing of agricultural products. Transfer of agricultural products processing technology, Organization of training and workshops on rural technology application.

- **G. S. Sanyal School of Telecommunications**: Radar signal processing, BioMedical Signal Acquisition and Processing; MAC protocols in Wireless Adhoc Networks and WMAN, Physical Layer Technologies for Next Generation Cellular, WMAN and WLAN, Loss-less Compression Methods for Images and Pictures, Channel Estimation and Equalization Method for Multi-carrier Wireless, Synchronization algorithms for OFDM based wireless transmission, Wireless Sensor Networks,

- **Rajiv Gandhi School of Intellectual Property Law**: Research in diverse issues of Intellectual Property Law and Policy framework under the Microsoft Centre of Excellence in Intellectual Property Research and Technology Policy Creation of Multimedia based Courseware for E&IT students to be implemented by IIT Kharagpur

- **Ranbir and Chitra Gupta School of Infrastructure Design and Management**: The school was inaugurated by Padma Bhushan Professor Lord Shusantha Kumar Bhattacharyya of Warwick Manufacturing group on 18th of August 2008 (Institute Foundation Day). An advisory Council comprising eminent experts from different fields as external experts has been constituted

- **School of Information Technology**: Systems Security: Survivable information system architecture to tolerant with potential information warfare attacks is under development. Such systems are typically characterized by the presence of a large repository of sensitive data in a distributed environment. The architecture takes into account the presence of multiple operating systems and database platforms, their known and potential vulnerabilities as well as possibilities of simultaneous attacks from adversaries. It will be developed as a generic model which can be used to build specific information systems in a number of application domains like e-governance, finance and insurance, education, etc. Development of architectures, protocols and algorithms for mobile ad-hoc networks, vehicular ad-hoc networks, wireless sensor networks and wireless mesh networks, smart grid communications, cloud computing, characterization and incorporation of emotions in speech, speaker recognition system for handheld devices in varying background environments and development of Text-to-Speech (TTS) system for Indian languages. Various areas of network security are being explored, like penetrating testing, development of new algorithms for cryptography, their efficient and attack-resistant hardware implementation etc.


- **Vinod Gupta School of Management**: Conducting Management Development Programs and In-House Training Programs for various industries.
Infrastructure Development

In view of the requirement of constant modernization in infrastructure and experimental facilities the Institute has acquired and installed several new scientific equipments and created facilities in the Departments, Centers and Schools. These are:

- **Aerospace Engineering**: IBM X3755 M3 Server with 4 AMD Opteron 12 core 6220 processors (48 cores), 2.4 GHz, 16 MB L3 cache, 256 GB DDR3 @ 1333 MHz for Departmental Computer Laboratory; Digital Protractor (Angle Indicator), Model: PRO-3600, Make: Smart Tools Technology, USA to be used for wind tunnel model setting in Aerodynamics Lab; ePIV System including hardware and FLOWEX Software. Make: Interactive Flow Studies Corporation, USA. It is an educational Particle Image Velocimetry System meant for Laboratory demonstrations in Aerodynamics Laboratory.


- **Architecture and Regional Planning**: 10 licenses of DesignBuilder and EnergyPlus -- Building Energy simulation software -- from USAID ECO-III project; Large format scanner.

- **Biotechnology**: Peristaltic Pump; Cell Disrupter; Fume Exhaust Hood Biobase; Rotavap System; HPLC (Analytical).

- **Chemical Engineering**: Gas Chromotograph System; HPLC; High Performance Cluster; Atomic Absorption Spectrophotometry Unit; Automated Surface Area &Pore Size Anlyzer; Evaporation Unit & Liquid Nitrogen Container.

- **Civil Engineering**: Total organic carbon analyzer; Atomic absorption spectrophotometer; Seismic piezocone; In situ testing vehicle; MASW system for shear wave velocity profiling; Resonant column for small strain dynamic testing system for soil; Digital direct shear apparatus for soil testing.

- **Electrical Engineering**: Mono-crystalline cell based PV modules and their support structure with Bi-annual sun tracking mechanism has been installed on the rooftop of the Electrical Engineering Dept. Total 108 modules with an installed capacity of 17.68 kWp (at STC) has been installed. However, in real operating conditions they may provide maximum 11 kW power output. Electrical energy output from solar PV array is available at the DC Busbar in the Energy lab through DC cable interconnection from the rooftop.

- **Geology and Geophysics**: A PC Based Gamma Ray Spectroscopy System GSPEC (for low level radiometric prospecting and assaying both in the laboratory and in-situ in the field/area of study, for ambient radioactivity measurements); An HANNA multiparameter meter (for measuring water quality); A FRANTZ magnetic barrier separator; A FRITSCH disc mill.

- **Mathematics**: Dell Blade Servers - 2 Units; Lenovo Desktop computers - 10 Units; Dell Desktop computers - 50 units; Online UPS 10 KVA - 2 Units; Online UPS 20 KVA - 1 Unit; Tetcos NetSim Software.

- **Mechanical Engineering**: Dell precision T7600 workstation; Precision spectral pyrometer; Twin hopper powder feeder; Micro vicker indenter for Leco LM 700 micro-hardness tester; Vacuum tube furnace; Torsion testing machine; B&K 2250-L-D30 Hand held analyzer 2250 light with 1/3 octave frequency analyser software; Cosmos make surface grinding machine; Micromatic make precision external cylindrical grinding machine; Die sinking electro-discharge machine; Chamber furnace with temperature controller and control panel; Contact angle meter; All geared universal milling machine; CNC flame cutting machine nesting software; Single axis stepper motor ball screw driven close loop controlled table with encoder; Indus make portable gas analyser; Electra CNC wire cut electro-discharge machine; 4-ch input module LAN-XI 51.2kHz; Cosmos high precision NC surface grinding machine; All geared lathe machine; Otis passenger elevator;
Server mounted rack; SIMPACK Perpetual academic license multibody dynamics simulation tool; Sulzermetco power supply unit 10MR-04; Sulzermetco complete 9mc plasma control unit; Complete 9mcd plasma distribution unit; 2T friction stir welding unit; Trmsys software package; Gear hobbing machine; One time up-gradation of existing MSC ADAMS university 50 user license; Computer-controlled open-circuit subsonic wind tunnel with accessories; Rotary type torque sensor (Model 1702-20); Product code VL-EDU.01-1-FY LMS virtual lab educational bundle LMS virtual lab software; Mapple software and mapplesim; Magic RP SG module EOSTYLEE2; Motion simulation system; Computerized engine test set up for four cylinder four stroke MPF1 petrol engine; Nx8.5 academic CAD/CAM/CAE bundle perpetual license with one year ME&S; In-vehicle human vibration analyzer; CATIA V6 academic pack; Object 3D printer desktop series object30 scholar; Water Jet System; Multi channel - signal conditioner for rotating dynamo-meter.

- **Metallurgical and Materials Engineering**: Thermal Conductivity Analyser; Slurry Erosion Test Set Up; Impact Wear Testing Set Up; Ultra Pure Water Purification System; Fretting Wear Test Set-up.

- **Mining Engineering**: Los Angles Abrasive tester; Flicker tester LED based; Bomb Calorimeter Model 6100 EF; Autoclave; Pneumatic trainer Ron make cat No. 4030; Dust Track DRX; Centrifugal Pump (closed circuit); Electro Hydraulic trainer; Temperature controlled gas desorption on canister with portable gas measurement system; Refrigerated Centrifuge High Speed ( Make – REM 1 without rotor head) model C-24BL; Experimental set-up for the 2nd part of Slurry flow; 4800 Start synth Microwave synthesis Lab Station; Pilot Plant for Air Pollution control Equipment (Bagfilter).

- **Ocean Engineering and Naval Architecture**: NAPA Ship Design software, ADCIRC with SMS Interface, ORCAFLEX, WAMIT, MAXSURF, SHIPFLOW, Milling machine installed in Welding Laboratory.

- **Physics and Meteorology**: X-ray Photo-electron Spectroscopy; Optical Lithography.

- **Centre for Educational Technology**: CET connected 15 locations though Video Conferencing both in IIT-Kharagpur and in extension centers in Kolkata and Bhubaneswar. The main purpose of the same is to run part time M Tech programs in Electronics & Communication Engineering and Electrical Engineering for AICTEE recognized college teachers. It is also used for conducting various meetings, overseas interviews etc. The project cost around 270.00 lacs for various equipments and studio upgradation. 20 or more manpower has been trained to operate the system to provide support for the same; The video studios are being updated to HD (High definition) system and as a result new set of instruments like camera, switcher etc are being installed; Establishment of Video Systems Laboratory at CET: A state-of-the-art video systems laboratory has been set up with purchase of audio / video equipment worth Rs. 80 lakhs. Centre also creating the largest active video lecture storage system of 400TB.

- **Materials Science Centre**: Rotary vacuum evaporator (Heidolph), Microwave synthesis system (China National Corp.), Ageing oven, Source Meter (Keithley), Computerized; channel battery analyzer (MTI Corp.), Precision Impedance analyzer (Waynekerr), Moisture & oxygen control Glove box (Mbraum, Germany), Single channel FFT analyzer, Electrometer with GPIB & RS232 (Keithley).

- **Rubber Technology Centre**: Dynamic Mechanical Analyser(DMA)- Metraviv, France.

- **G. S. Sanyal School of Telecommunications**: FPGA test/ Programming facility with data acquisition cards; Radio Transceivers with FPGA test/ Programming facility; Embedded DSP Board with data acquisition; OPTSIM: An Optical Communication System Design and Simulation tool.

- **School of Water Resources**: Three numbers of HCL desktop computers in the Computer Simulation and Design Laboratory; Creation of a new classroom with projector, screen and other facilities; Installation of Wi-Fi system; Books for departmental library; Acquisition of meteorological data from IMD, Pune.
As a part of the ongoing infrastructural development, various construction projects have been taken up by Estate Civil Head Office. Current status of those projects is as follows:

- **Students accommodation**: The entire Lal Bahadur Shastri Hall of Residence with 667 rooms have been handed over. One more Block of Bachelor Flat has been renovated and handed over for use of Girl students.

- **Nalanda Classroom Complex**: 44 class rooms have been handed over & Furniture etc. for 30 class rooms have been completed for use.

- **J. C. Ghosh Science Block and P. C. Roy Laboratory Block**: Floor slabs for both the Blocks up to 5th floor is complete.

- **Residential apartments for faculty and staff**: 64 Nos. 1BR Flats have been handed over and occupied. 64 Nos. 2BR Flats have been handed over and occupied.

- **Sir A. J. C. Bose Laboratory Complex**: Construction of extension portion is already over and 4 more laboratories have been handed over.

- **New water supply project**: 8.00 km. of pipelines have been laid. Construction at river bed is going on.

- **Construction of new Kendriya Vidyalaya**: Construction is already complete and area development has also been completed. The School is already shifted to the new location and functioning.

- **New market complex behind B. C. Roy Hospital**: Four shops have been newly constructed and the old shops near Electric Overhead Office have been demolished. A new block has also been constructed.

- **Development of children parks at campus**: Six children parks at Campus have been developed.

- **Expansion work in academic buildings**: Entire Expansion work of Department of IE&M, Chemical Engineering and New buildings for Department of Mechanical Engineering and Computer Science & Engineering have been completed. Expansion work of Department of Biotechnology is going on.

### International Collaboration

The Institute has always been active in establishing international collaborations to achieve progress in academic fronts. During the academic year 2012-2013, the Institute has signed several MoUs for the purpose of faculty and student exchange. These are:

- Joining and Welding Research Institute,
- University of Osaka, Japan;
- United Nations University on Climate and Ecosystems Change Adaptation Research, Japan;
- Friedrich Schiller University Jena, Germany;
- Rhein-Waal University of Applied Sciences, Germany;
- Leibniz-Institut fur Polymerforschung, Dresden, Germany;
- The University of British Columbia Applied Science;
- The University of Alberta, Canada,
- National Taiwan University of Science and Technology, Taipei, Taiwan and
- Moscow State Mining University, Moscow, Russia.

### Sponsored Research and Industrial Consultancy

The synthesis of teaching and research is fundamental to IIT Kharagpur. IIT Kharagpur is highly rated for the quality and breadth of its research enterprise, for the innovation of its faculty, for the excellence of its Ph.D programs, and for the amount of funding received in support of its research initiatives. We are particularly noted for our openness to multidisciplinary research, and several new initiatives expand a long IIT Kharagpur tradition of cross-disciplinary research and collaboration. Today, our faculty and researchers in energy and the environment are exploring the development of renewable technologies to enable us to coexist with a bio-diverse planet. Through computation and information technologies, IIT Kharagpur researchers are deepening our comprehension of a multi-faceted world.
Our research groups in nanotechnology and microscale processes are enabling the development of new materials and methods that support a safer, more cost-effective, and sustainable environment. The impact of our research ripples through India and around the world. IIT Kharagpur’s research programs reach across the campus and beyond, linking together all departments, academic centers and a large number of advanced R&D laboratories, stimulating the integration of inquiry, new knowledge, and education.

Some of the noteworthy research initiatives and collaborative research facilities in recent years include:

- Centre for Railway Research
- P. K. Sinha Centre for Bioenergy
- Steel Technology Center
- R&D Center in collaboration with DVC
- Tea Engineering Research Center
- Centre of Excellence in Information Assurance
- National Program in Marine Hydrodynamics
- Vodafone-Essar-IIT Kharagpur Centre of Excellence in Telecommunications
- National facilities for EPMA
- Rural Technology Action Group (RUTAG)
- General Motors Collaborative Research Program
- Advanced VLSI Design Laboratory
- Research Laboratory in Electronics Controls and Software

In the past year IIT Kharagpur has received a number of high-value and flagship projects from the government and the industry such as –

- Online monitoring system for OHE traction parameters by RDSO, Lucknow
- Design & development of an on-board intelligent embedded platform for detection of weak failure modes and prognosis of severe faults in locomotives and associated equipment by RDSO, Lucknow
- Preparation, characterization and performance of functionalized membrane with improved anti-fouling properties by BRNS, DAE, Mumbai
- Thermomechanically processed high strength bainitic steel rails for Indian Railways by RDSO, Lucknow
- Aerodynamic design of traction rolling stock with speed potentials of 250 km/h upgradeable up to 350 km/h by RDSO, Lucknow
- Teachers empowerment, student empowerment and integration of tools for improvement - synchronous delivery (talk to a teacher) by MHRD, New Delhi
- Studies on shrinkage swelling characteristics of some Indian coals to ascertain recoverability of CBM from deep seated coal and shale resources by CMPDI, Ranchi
- Development of rubber compound and repair techniques for trailing cables of underground mining machines, by CMPDI, Ranchi
- Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning ice - main phase by MHRD, New Delhi

Besides these newly initiated research projects, IIT Kharagpur has been engaged in a number of ongoing innovative and socially relevant funded research activities. A partial list of which includes the following:

- Scientific evaluation of high voltage insulator conditions/predictions of residual life of composite insulators by RDSO, Lucknow
- Total synthesis of mayamycin, a c-glycosidic angucycline by SERB, New Delhi
- Smart nano-sensors for medical, coal mine and environmental monitoring by SERB, New Delhi
- Development of composition and standardization of properties of composite brake blocks for application in coaches of indian railways by RDSO, Lucknow
- Experimental & numerical studies on deep excavation under static & seismic conditions by SERB, New Delhi
- Novel polymeric composite membranes for selective separation of gas mixtures by SERC, New Delhi
• Development of microbial fuel cell for direct electricity recovery during waste water treatment by SERC, New Delhi.
• Development of expert system for indian blast furnace by Ministry of Steel, New Delhi.
• Aakash Development Laboratory (AADL) at IIT Kharagpur by MHRD New Delhi.
• Catalytic hydrolysis by a microbial enzyme with potential of an antibiotic target by DST, New Delhi
• Suspension and bogie technology for high speed trains by RDSO, Lucknow.
• Supporting consolidation, replication and upscaling of sustainable waste water treatment and reuse technologies for india (saraswati) by DST, New Delhi.
• Fast fixed point algorithms for identifying alertness and emotions, Samsung, Korea.
• Development of technology and prototype facility for enhancement of shelf life of fruits and vegetables through active packaging & modified atmosphere storage by DBT, New Delhi.
• Involvement of functional single nucleotide polymorphisms (SNP) of matrix metalloproteinase (MMP) gene promoters in the cell type specific regulation of human MMPs: intrinsic genetic characteristics in cancer cell progression by DBT, New Delhi.
• Development of pilot scale palletisation technology for Indian geothitic/hematite ore with varying degree of fineness by Ministry of Steel, New Delhi.
• Tracking of ultrasonography machines towards prevention of its misuse by Ministry of Health and Family Welfare, New Delhi.

During the year 2012-2013 the Institute received from the Government, private and international funding agencies/enterprises **145 research projects for a total value of Rs. 129.87 crores and 151 consultancy projects worth Rs. 14.5 crores** aggregating a total of 296 projects for Rs. 144.37 crores.

The Intellectual Property Rights and Industrial Relations (IPR & IR) Cell under SRIC is responsible for the licensing and the transfer of technologies developed by researchers at IIT Kharagpur to the commercial sector. Till date, more than 400 patents were filed and more than 120 were granted and a total of 19 technologies were transferred. This year IPR&IR Cell under SRIC carried out **unique drive – 100 Days 100 Patents**. The Institute Faculty, students and staff supported and responded whole heartedly and more than 200 abstracts were received and finally more than 100 patent applications have been sent out to patent attorneys for the filing applications to patent office. IPR&IR Cell in collaboration with Rajiv Gandhi School of Intellectual Property Law conducted **3rd Intellectual Property Rights Researcher’s Confluence on Information Technology-Telecommunication (ICT): Emerging Issues in Intellectual Property (IP)**.

The Entrepreneur Cell under SRIC supports a variety of incubation programmes funded by the Government.

Students are encouraged and supported to take up innovative challenging problems. One of the examples is **TeamKART** under Formula Student. Formula Student (FS) is Europe's most established educational motorsport competition, run by the Institution of Mechanical Engineers. It seeks to challenge university students to conceive, design, build, cost, present and compete as a team with a small single-seat racing car in a series of static and dynamic competitions. Recently IIT Kharagpur team has participated in Silverstone track in UK.

Technology Transfer Group (TTG) is a students' initiative under the aegis of SRIC, IIT Kharagpur, which believes in the potential of the Institute as a premier Research & Development centre. TTG acts as a link between the industry and the academia to facilitate transfer of industry ready technologies and presenting IIT Kharagpur as a research consultant. TTG also organized **TEDx IIT Kharagpur event on the theme – The Unturned Page**. The event hosted eminent speakers such as Professor Sugata Mitra, Mr. Shubhranshu Choudhary, Mr. Kailash Satyarthi, and Mr. Aniruddha Sharma who mesmerized the IIT community by sharing their experiences.

**STEP - IIT Kharagpur**

STEP IIT Kharagpur, the core of IIT Kharagpur entrepreneurship ecosystem is dedicated to extend every possible support to promote and development of innovation and entrepreneurship in this country. Since inception over 25 years ago, STEP has been engaged in various kind of activity to
enhance the economic condition of this part of country through innovation and enterprise creation and gradually transformed itself as a sustaining innovation & entrepreneurship ecosystem as well as enterprise creation platform. It is the most active innovation and incubation activity within the entire IIT system. STEP in association with Rajendra Mishra School of Engineering Entrepreneurship, provides leading edge financial, managerial, technical, legal and expert mentoring support as well as co-incubation facilities to innovators and entrepreneurs in and around eastern India. In association with various departments of state and central governments and nodal agencies, it facilitates various kind of financial support i.e., financial grants and seed loan facilities for product development and enterprise creation. At present around 60 startup companies are incubated at STEP IIT Kharagpur, in various domains such as information & communication technology, health care, manufacturing, agriculture, electrical, electronics and chemical domain. STEP IIT Kharagpur has facilitated various kinds of financial grants and seed support to innovators and entrepreneurs, such as, around Rs. 2.00 crores of Innovation Grant to 31 innovators and Rs 40.15 lakhs to 9 microenterprises for scale up and also facilitate ample funds for technology transfer and commercialization. Till date, STEP and its Technology Incubation & Entrepreneurship Training Society (TIETS) has provided around Rs 2.32 crores of seed support to 20 startups with an excellent recovery rate. Organizations like Capillary Technologies Pvt. Ltd., P2Power solutions Pvt. Ltd., S M Technologies Pvt. Ltd., Data Resolve Technologies Pvt. Ltd., Sankalp Semiconductors Pvt. Ltd., People’s Advanced Communication Technologies Pvt. Ltd. etc. have started their journey from STEP IIT Kharagpur as startups and they have availed variety of incubation supports, eventually transforming into phenomenally successful enterprises in the real competitive commercial space. In order to extend its capacity STEP IIT Kharagpur has already in the process of expansion and 4500 sq. feet is almost ready and will be functional from the month of September, 2013. The 2nd phase of construction of Incubation Lab is under process, with eventually 40,000 sq ft of built-up space for supportive incubation within 12 months.

A high tech VLSI product design and testing lab is available for the incubatees which fulfills the fast prototyping, design and test measurement requirements of Techno Entrepreneurs. Besides, a Health Management Lab is an integral part of our inclusive scalable health delivery activity for providing affordable and accessible health care for rural and semi-urban population of our country.

STEP has always initiated, nurtured and strengthened its international co-entrepreneurship collaborations by establishing its successful “The Global Venture Lab”, a global academic consortium for the development of innovation and entrepreneurship, initially started in collaboration with University of California, Berkeley, USA and Jyvaskyla University, Finland. Later on eminent universities like Alto University, Helsinki, Finland, University of Aberdeen, Scotland, Johns Hopkins University, United States and Laval University, Montréal, Canada have joined the consortium to expand the diversity and excellence of this unique alliance. Last year National Chiao Tung University, Taiwan has setup an extension centre at STEP IIT Kharagpur for academic as well as entrepreneurial collaboration.

Conferences, Symposia, Seminars and Workshops

The Institute lays great emphasis on knowledge dissemination, and encourages organization of conferences, symposia and workshops. The last year saw Departments, Centers and Schools of the Institute organizing many such activities which attracted a large number of participants from India and abroad. Some of the important ones are:

- **Agricultural and Food Engineering** : Advances in Micro Irrigation and Greenhouse Technologies (February 14-15, 2013); Engineering & Management in Fisheries & Aquaculture (June 23-30, 2011); Hyperspectral remote sensing and applications in water resources; IIT-CII FACE Certified Food Professional Course on Food Safety and Quality Management (FSQM-2013) (February 18 - March 8, 2013); Micro-irrigation and Greenhouse Technology (November 15-16, 2012); Plasticulture applications in Horticultural Crops (July 16-17, 2012); Plasticulture Applications in Horticultural Crops (December 20-21, 2012); Precision Farming in Horticulture (March 14-15, 2013); Precision Farming Practices in Horticulture (September 17–18, 2012); Protected Cultivation Technologies (January 17-18, 2013); Protected Cultivation Technologies (June 11-12, 2012); Scope of Greenhouse and Plasticulture in Horticulture (October 8-9, 2012); Sprinkler and Micro-irrigation (August 23-24, 2012).

• **Electrical Engineering**: Tata Power Course (2 weeks).

• **Electronics and Electrical Communication Engineering**: Advanced DSP Design Techniques (July 2-6, 2012) Electromagnetic Environmental Effects Management (December 11-20, 2012); ISRO Scientists Refresher program on Basic Theoretical topics of RF and Microwaves (14 days); Microwave Fundamental & its applications to Radar and Avionics (May 21 June 2, 2012); QIP Short Term Course On Microwave Fundamentals & its aplications in Radar and Avionics (May 21 – June 2, 2012); Refresher Program on Basic Theoretical Topics of RF and Microwave (January 14-27, 2013).

• **Humanities and Social Sciences**: Essentials of Writing (August 2 - 8, 2012); The Futural Critical Constellations: The Cultural politics of the Neo-empire (5 Days).

• **Industrial Engineering and Management**: A Course on Lean Manufacturing for managers of different companies; Conducted a Course on PLM/PDM for DRDO Professionals; Decision modeling in Facility Planning (July 4-8, 2011); Facility Layout and Decision Modeling (July 4-7, 2011); Industrial safety engineering (December 22-24, 2012); One-Day Duration Seminar on ‘SME Performance – Quality and Environmental Sustainability’ (September 26, 2012); One-Day Workshop on ‘Asset Management for Railway Systems: Opportunities and Challenges (February 1, 2013); Project Management (February 24-26, 2012); Project Management (May 11-14, 2013); Reconfigurable Manufacturing System for Faculty members of different Technical Institutes (One week); Short-Term Course on ‘Industrial Safety Engineering’ for Industry Participants (December 21-23, 2012); Total Quality Management (September 16-18, 2011); Workshop on Total Quality Management for Industry Professionals (May 3-4, 2012).

• **Mining Engineering**: Accident Prevention and safety Management in Mines (November 6-9, 2012); Project Land Acquisition Rehabilitation Resettlement of Displace People (July 11-14, 2012); Project Land Acquisition, CSR and Sustainable Development (February 20-23, 2013).

• **Ocean Engineering and Naval Architecture**: Short term course on Practical Shipbuilding for Officers of Mazagon Dock Ltd (February 4-15, 2013).

• **Cryogenic Engineering**: Cryogenic Air Separation and Oxygen Safety-2012 (6 days); Term Course on Vacuum Technology and Process Applications (November 1-10, 2012).

• **Reliability Engineering Centre**: Reliability Measurement and Demonstration Methods (6 days).

• **Materials Science**: Advanced materials; Nanotechnology for Electronics & Photonics Applications (2 weeks (October 3-17, 2012); Renewable Energy Materials and Their Industrial Application (2 weeks).

• **Rajendra Mishra School of Engineering Entrepreneurship**: Faculty Development Programme - Academic Aspects of Entrepreneurship (2 weeks); Faculty Development Programme - Entrepreneurship theory and Practice (2 weeks).

• **School of Information Technology**: Short Term Course on Internet Programming with Java (June 18 – July 5, 2012).

• **Vinod Gupta School of Management**: Advanced Management Programme for Executives from Mining Industry (February 18-22, 2012); AICTE Approved Short Term Course. Title: “Consumer Behavior: Role Of Market Research (May 21-25, 2012).
Continuing Education Programme

The Continuing Education Programme is a significant academic domain of the Institute. Over the years, it has diversified in terms of coverage of disciplines, duration and level of the programmes and industries served. The activities includes providing continuing education and training to professionals from industries – large and small, providing opportunities to teachers of Engineering Colleges to update their knowledge through short term courses and pursuing M.Tech. and Ph.D programme under QIP. Also, CEP promotes teaching-learning resource materials in the form of printed text, CDs and computer aided instruction packages etc.

The break up of the activities of continuing education programme during 2012-2013 are as following:

AICTE SUPPORTED ACTIVITIES:

- **Formal Degree Programmes under QIP**
  - No. of Teachers completing Ph.D degree --- 11
  - No. of Teachers completing M.Tech degree --- 09
  - No. of Teachers joined Ph.D programme --- 08
  - No. of Teachers took advance admission --- 11
  - No. of Teachers joined M.Tech. programme --- 06
  - QIP Short Term Courses --- 10 (12 weeks)
  - Total No. of participants (QIP) --- 320

- **Self-Financed Short Term Courses**
  47 self-financed short term courses (both on campus as well as off campus) have been conducted for professionals employed in industry, R&D organizations which include IT related training as well. Certificates were awarded to 3240 participants. Moreover 13 nos. workshops/conferences have been organized by the Faculty members of the Institute with the help of this centre.

- **M. Tech Programme organized by the Unit**

<table>
<thead>
<tr>
<th>Name of the Subject</th>
<th>No. of Students</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Engineering</td>
<td>28</td>
<td>3 Years</td>
</tr>
<tr>
<td>Electronics and Electrical Communication Engineering</td>
<td>50</td>
<td>3 Years</td>
</tr>
<tr>
<td>Information &amp; Communication Technology</td>
<td>42</td>
<td>3 years</td>
</tr>
</tbody>
</table>

Laurels and Distinctions Awarded to Faculty

The teachers and students of IIT Kharagpur have been receiving awards and honours, laurels and distinctions in recognition to their excellence. This year, too, faculty members have been honoured with prestigious awards and elected as Fellows of the National Science and Engineering Academies. The students have also been rewarded with various scholarships and their contribution has been recognized for their stellar performance in various conferences, symposia etc. Herein, I highlight these achievements.

**Fellowships**

- **Dr. Rintu Banerjee (Ag&FE)**
  - Selected for the Fellow Award (FIFIB) of the International Forum on Industrial Bioprocesses for the year 2012

- **Dr. Sirshendu De (ChE)**
  - Elected Fellow of The National Academy of Sciences, India, Allahabad, in the year 2012

- **Dr. Dipak Ranjan Mal (CY)**
  - Elected Fellow of West Bengal Academy of Science & Technology for the year 2012
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Awards/Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Subhasish Dey (CE)</td>
<td></td>
<td>• Elected Fellow of The National Academy of Sciences, India, Allahabad, in the year 2012</td>
</tr>
<tr>
<td>Dr. Pallab Dasgupta (CSE)</td>
<td></td>
<td>• Elected Fellow of the Indian National Academy of Engineering (INAE), in recognition to his distinguished contributions to &quot;Engineering&quot;</td>
</tr>
<tr>
<td>Dr. Ashok Kumar Pradhan (EE)</td>
<td></td>
<td>• Elected Fellow of the Indian National Academy of Engineering (INAE), in recognition to his distinguished contributions to &quot;Engineering&quot;</td>
</tr>
<tr>
<td>Dr. Anindya Sarkar (G&amp;G)</td>
<td></td>
<td>• Elected Fellow of West Bengal Academy of Science &amp; Technology for the year 2012</td>
</tr>
<tr>
<td>Dr. Anil K. Gupta (G&amp;G)</td>
<td>(currently on lien as Director, Wadia Institute of Himalayan Geology, Dehra Dun, Uttarakhand)</td>
<td>• Elected as Fellow of the Third World Academy of Sciences (FTWAS), in recognition to his outstanding contribution to science and its promotion in the developing world</td>
</tr>
<tr>
<td>Dr. Manoj Kumar Tiwari (IEM)</td>
<td></td>
<td>• Elected Fellow of the Indian National Academy of Engineering (INAE), in recognition to his distinguished contributions to &quot;Engineering&quot;</td>
</tr>
<tr>
<td>Prof. P. L. Narasimhan (IEM)</td>
<td>TVS Motors Chair Professor</td>
<td>• Elected Fellow of the Indian National Academy of Engineering (INAE), in recognition to his distinguished contributions to &quot;Engineering&quot;</td>
</tr>
<tr>
<td>Dr. K. N. Tiwari (Ag&amp;FE)</td>
<td></td>
<td>• Selected by the Indian Agricultural Research Institute, New Delhi, for the XIIIth Hari Krishna Shastri Memorial Award for the year 2012 for his outstanding research contributions in automation of micro-irrigation and greenhouse technology</td>
</tr>
<tr>
<td>Dr. Rintu Banerjee (Ag&amp;FE)</td>
<td></td>
<td>• Received the Panjabrao Deshmukh Outstanding Woman Scientist Award 2012, conferred by the Indian Council of Agricultural Research, New Delhi</td>
</tr>
<tr>
<td>Dr. Madan Kumar Jha (Ag&amp;DE)</td>
<td></td>
<td>• Awarded the Commendation Medal 2012 by the Indian Society of Agricultural Engineers (ISAE), New Delhi for his outstanding contributions in the field of Soil and Water Engineering</td>
</tr>
<tr>
<td>Dr. Tarasankar Pal (CY)</td>
<td></td>
<td>• Awarded the Tokyo University of Science President Award to visit the university</td>
</tr>
<tr>
<td>Dr. Rajib Maity (CE)</td>
<td></td>
<td>• Selected by the Executive Council of Indian Society for Hydraulics for Prof. R. J. Grade Research Award for the year 2012</td>
</tr>
<tr>
<td>Dr. Pallab Dasgupta (CSE)</td>
<td></td>
<td>• Winner of the ISA TechnoMentor Award 2012 from the India Semiconductor Association (ISA), Bangalore</td>
</tr>
</tbody>
</table>
Dr. Niloy Ganguly (CSE) • Recipient of the Yahoo! 2012 Faculty and Research and Engagement Program (FREP)

Dr. Animesh Mukherjee (CSE) • Selected for the INAE Young Engineer Award 2012

Dr. Rabindra Kumar Pradhan, (HSS) • Recipient of the award for "Excellence in Training and Human Resource Development - 2012", conferred by the Indian Society for Training and Development (ISTD), Hyderabad Chapter

Dr. Jyotsna Dutta Majumdar, (MME) • Selected for the prestigious "2012 Metallurgist of the Year Award", instituted by the Ministry of Steel, Government of India

• Selected for the MRSI Medal for the year 2013

Dr. Nikhil Kumar Singha (RTC) • Selected to receive the "MRSI Medal" for the year 2013

• Recipient of the "Polymer Foundation Award", awarded by the Professor Sukumar Maiti Polymer Award Foundation, Kolkata, for his innovative research contribution in the field of Polymer Science and Technology

Dr. Sudip Misra (SIT) • Selected for the 6th IEEE Asia Pacific (AP) Outstanding Young Researcher Award

Dr. Chandan Chakraborty (SMST) • Selected to receive "2012 IBM Faculty Award", awarded by the IBM India University Relations in recognition to his exceptional efforts in building and leading innovation

• Selected for the prestigious IBM-Shared University Research (SUR) Award for 2013.

**Membership of Editorial Boards**

Dr. Abraham George (ARP) • Selected an Editorial Board Member of the Journal of Education and Practice, published by International Institute for Science, Technology & Education

Dr. Subhasish Dey (CE) • Invited to join as an Associate Editor for the Journal of Hydraulic Research, published by the International Association for Hydro-Environment Engineering and Research (IAHR)

Dr. Sankar Kumar Nath (G&G) • Invited to join as a Member of the Editorial Board of the International Journal of Earthquake Engineering and Hazard Mitigation (IREHM), published by Praise Worthy Prize S.r.l. Publishing House, Naples, Italy

• Invited to join as a Member of the Editorial Board of the ISET Journal of Earthquake Engineering, published by Indian Society of
Earthquake Technology

Dr. Dilip Kumar Pratihar (ME)

• Appointed as Member of the Editorial Board of the International Journal “Advances in Robotics Research”, published by Techno Press, Korea

• Appointed as Member of the Editorial Board of the International Journal of Information Engineering (IJIE), published by American V-King Scientific Publisher

• Appointed as Member of the Editorial Board of the International Journal “Statistics, Optimization & Information Computing”, published by International Academic Press

• Appointed as Member of the Editorial Board of the International Journal of Mechanic Systems Engineering, published by American V-King Scientific Publisher

Dr. Debabrata Lahiri (RDC)

• Invited to take over the responsibility of Editor-in-Chief of the journal “Economic Affairs” - a quarterly journal of economics

Achievements By The Students

Laurels:

Ms. Ranjita Das
CY, 09CY9715

• Young Scientist Award in the “Acharya Prafulla Chandra Ray Memorial Symposium on Chemistry & Industry (2012)” by the Indian Chemical Society, Kolkata

Ms. B. Nandini,
ChE, 12CH91R04

• Innovative Student Projects Award 2012 from Indian National Academy of Engineering for the Master’s Thesis

Shri Santhosh Prabhu
Ex-M.Tech. Student, CSE

• Innovative Student Projects Award 2012 from Indian National Academy of Engineering for the Master’s Thesis

Shri Arvinder Singh,
PH, 11PH91F01

• ISCA Young Scientist Award for the paper in the 100th Session of Indian Science Congress (Materials Science Section) held at Kolkata.

Shri Inderjeet Singh
Roll No. 12PH90J02

• Best poster award for the paper in the 100th Session of Indian Science Congress (Materials Science Section) held at Kolkata.

Ms. Akhtar Jahan Siddiqa
MS, 09MS9404

• Best poster presentation for the paper in the Kathmandu Symposia on Advanced Materials 2012

Shri Pankaj Kumar Rawat
MS, 11MS91F03

• Best poster award for a paper in the 6th India-Singapore Joint Physics Symposium on Physics of Advanced Materials held at IIT Kharagpur
Shri Tippa Muniraja
AE 11AE3006
• Awarded Governor’s Medal, West Bengal as an NCC Cadet for his high performance, involvement and discipline in all NCC activities.

Shri Anuj Gopal
PH, 12PH20003
• Received an Honorable Mention in the All India Essay Writing Event 2012 by the Shri Ram Chandra Mission, in association with the United Nations Information Services for India & Bhutan (UNIC)

Shri Abhinav Pandey
G&G, 12GG20001
• Received an Honorable Mention in the All India Essay Writing Event 2012 by the Shri Ram Chandra Mission, in association with the United Nations Information Services for India & Bhutan (UNIC)

Scholarships:

Shri Sanyam Agarwal
12CS10045
• OP Jindal Engineering and Management Scholarship 2012

Shri Aashish Kumar
11EC10001
• OP Jindal Engineering and Management Scholarship 2012

Ms. Aishwarya Roy
11ME10073
• OP Jindal Engineering and Management Scholarship 2012

Shri Tallavajhula Abhijeet
09ME1028
• OP Jindal Engineering and Management Scholarship 2012

Shri Piyush Bagaria
09EC1026
• Aditya Birla Scholarship 2012

Shri Himanshu Uniyal
09ME1001
• Aditya Birla Scholarship 2012

Shri Gaurav Kumar
10EC10020
• Aditya Birla Scholarship 2012

Shri Sandeep D’souza
11EC10045
• Aditya Birla Scholarship 2012

Shri Swarnabha Chattaraj
09EC1002
• Todai-IIT Undergraduate Students Scholarship 2012

Shri Abhishek Roy
09EC1001
• Todai-IIT Undergraduate Students Scholarship 2012

Shri Lakshya Jain
10ME10024
• Todai-IIT Undergraduate Students Scholarship 2012
Health Care

The Institute provides primary health care to the campus community through B C Roy Technology Hospital located strategically within the campus. Constant efforts are on to upgrade and improve the existing facilities at the B. C. Roy Hospital. Round-the-clock emergency service and a 24 hour pharmacy have been made available. Critical care ambulance support is provided in emergency situations. Special clinics are provided in Medicine, Chest, Paediatrics, Skin, Psychiatry, Orthopaedics, Eye, ENT and Dental etc. in addition to general outdoor services. Medical Insurance coverage through the Institute is available for the students. Immunization clinics are operated with the help of Consultant in Public Health and Paediatrician. Health Care remains a top priority in the activities of the Institute.

The different clinics in the Out Patient Department have been upgraded with modern diagnostic equipments. To name a few, Computerized Radiology Unit, Fully Automatic Biochemical analyzer, ICU Ventilator, Telemedicine Video Conference System, Video Slit Lamp and Auto- Refractometer, are some of the recently added equipments. A fully equipped Operation Theatre to meet the day to day need of the patients is on the anvil.

All the student hostels are regularly inspected by the visiting consultant in Public Health, who advises measures for improvement of sanitation and food services. Preventive Health Care is also functioning well. Personal hygiene measures of all hall workers are also being monitored.

Alumni Affairs

IIT-KGP alumni have been the face of the Institute for over 6 decades now. They have significantly contributed to the nation and the world following the motto of the Institute. Also they have contributed substantially to the evolution of their Alma Mater.

The Office of the Dean, Alumni Affairs & International Relations (AA&IR) is the chief coordinating center for all official communication, events and other activities on behalf of the Dean. The Office of AA&IR strives to excel in alumni relations and networking and create an effective platform for the alumni, students, faculty and other stakeholders of the Institute.

Under the Dean a program has been launched in 2010, the Institutional Development (ID) Program. Under ID Program and with support of the Students Alumni Cell, several activities are organized throughout the year –

Annual Alumni Meet : Held in January every year. The 10th Annual Alumni Meet was organized from January 4 – 6, 2012. The special batches were 1963, 1973 and 1988. About 150 alumni came from India and abroad and several on-campus alumni joined them as well.

Foundation Day : The office of the Dean organizes events on the occasion of the Foundation Day of the Institute. The 62nd Foundation Day was celebrated on August 18, 2012. The event was graced by alumnus Dharam Vir IAS (Retired), State Election Commissioner, Haryana.
**Mentorship Program**: One of the flagship initiatives of ID Program now in its 3rd year helping students to be mentored by the alumni.

**Awards**: The Dean is the primary coordinating authority for Distinguished Alumnus Award and Distinguished Service Award.

**Publications**: The print publications are KGPian – quarterly newsletter, Alumni Annual Report and the other annual souvenir Yearnings of Yore. Additionally there is an online publication KGP Connection which is an e-newsletter circulated every fortnight.

ID Program has brought into picture several new initiatives in 2012-2013.

**Students Alumni Regional Meets**: conducted in Bangalore in 2012 to bring together students and alumni and offer them a networking platform.

**Guest Lecture Conclave**: conducted in November 2012 at the IIT-KGP campus, the event saw interactive presentations from several achievers (alumni or otherwise) who motivated the students through their inspirational words.

**E-Guest Lecture Series**: conducted through Google+ Hangout, this is a series of e-lectures conducted throughout the year except for semester offs.

**Brand Building**: ID Program has been enhancing the IIT-KGP internationally and domestically in a streamlined manner. Starting from public relations activities, regular communication, social media and ranking data submission, the Institute has started taking small steps towards the big goal of Vision 2020.

**My Imprint Program**: Although launched with the class of 2011, the program made its mark among the students in 2012. Through this program, the outgoing students are requested to pledge their support towards the Institute initially by donating their caution money towards students’ services. More than 400 outgoing students form the Class of 2012 contributed towards this cause.

**Founding Endowment Batch campaign**: This is a grass root campaign which brings together alumni from individual batches and motivate them to donate collectively in the name of their batch. Each batch is given a minimum target of INR 50 lakhs. On reaching the mark, the batch will be honored by endowing a classroom after them in the Nalanda Academic Complex. Two batches have already succeeded. While the classroom endowed in the name of 1991 batch was unveiled on December 10, 2012, the 1970 batch will receive the honor in 2013. A corpus of more than 3 crores was generated in 2012-13. This will help strengthen the endowment fund of IIT-KGP.

**Training and Placement**

The Training and Placement Section is responsible for arranging practical training for 3rd year B. Tech/Dual Degree and 4th year M.Sc. degree students and job placement of final year students graduating from the Institute. The Section is actively engaged in forging synergistic relationships between the Institute and various industries and user systems of technical and scientific manpower. Based on these interactions, the T&P Section gives feedback to the Institute on the academic programmes.

**Summer Training Details**: Eight weeks of summer practical training at the end of 3rd year B. Tech/Dual Degree and 4th year M.Sc. degree is a compulsory part of the curriculum at IIT Kharagpur, carrying 2 credits. All efforts are made to place the concerned students in the best of organizations in India and abroad for summer training through Training and Placement section and various departmental supports. An emergent trend is that more and more students are seeking summer training abroad.

A total of 1400 companies/organizations in India were contacted for training facilities for the current summer vacations in May-July 2013. Among these 110 in India had offered training facilities, out of
which 45 organizations had extended out-of-pocket allowances (covering 270 students) and many other extended subsidized transport, subsidized canteen, subsidized accommodation and to-and-fro travel expenses (e.g. 3AC fare, air fare etc.) for our students. The highest out of pocket allowance of Rs. 60,000/- per month was paid by ITC Ltd. and Hindustan Unilever. Some other organizations such as GIDA offered Rs 52,500/- per month, Times Internet and American Express offered Rs. 50,000/- per month, Directi offered Rs. 45,000/- per month, Google, Amazon and Adobe offered Rs. 30,000/- per month, Yahoo, Qualcomm, and Microsoft offered Rs. 20,000/- per month. There are about fifteen (15) companies like Shree Cement, Tega Industries, Reliance India Limited, Infosys, Tata Motors, Siemens, Tata Steel, Schlumberger, Goldman Sachs offered stipend in the range Rs. 10,000/- to 20,000/- per month. Around fifteen companies offered below Rs. 10,000/- per month. In addition to the above some students arranged internship by themselves with good amount of stipend.

Out of 1180 third/fourth year B.Tech/Dual Degree/M. Sc. students, 90 students have taken up summer internship abroad in many Institutes/organizations like EPFL, Switzerland , University of Warwick, Deakin University ,Australia, National University of Singapore Memorial University, Canada University of Tokyo, Max Plank Institute for Software Systems, Germany University of Alberta, Biotechnology & Bio Chemical Engineering, Belgium Iowa State University, U.S.A., Rice University, Technical University of Berlin , Kyoto University, Japan Rhinewall University, Germany University of Freibrug University of Machigan, University of Hagen, University of Leeds, Bremen University Dong A University, Busan , Stanford University etc. and foreign companies like Finisar ,Malaysia ,Mitsubishi , Works Application , Japan , ST Engineering Marine Ltd., Singapore during May-July, 2013.

Placement Details : 209 companies / organizations have considered our students for employment during 2012-2013. The details of number of students who had registered for placement and those actually placed through campus interviews including those who have opted either for higher studies or arranged job through off campus as on 30.06.2013 are as follows:

<table>
<thead>
<tr>
<th>Course/Degree</th>
<th>No. of students registered</th>
<th>No. of students placed</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.Tech. (Hons.)</td>
<td>506</td>
<td>456</td>
</tr>
<tr>
<td>B.Arch. (Hons.)</td>
<td>21</td>
<td>17</td>
</tr>
<tr>
<td>5-year Integrated M.Sc.</td>
<td>121</td>
<td>97</td>
</tr>
<tr>
<td>2-year M. Sc</td>
<td>114</td>
<td>91</td>
</tr>
<tr>
<td>Dual Degree (B. Tech + M. Tech.)</td>
<td>289</td>
<td>265</td>
</tr>
<tr>
<td>M.Tech./MCP</td>
<td>724</td>
<td>458</td>
</tr>
<tr>
<td>M.B.A.</td>
<td>101</td>
<td>89</td>
</tr>
<tr>
<td>MS/Ph D</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Total</td>
<td>1916</td>
<td>1513</td>
</tr>
</tbody>
</table>

The Overseas Highest salary received in 2012-13 is $127000 per annum and the second highest is $119000 per annum.

The Highest salary received in INR is Rs. 28.5 lakh per annum and the second highest is Rs.28 lakh per annum in 2012-13.

Average Salary for 2012-2013 is as follows:

<table>
<thead>
<tr>
<th>Courses</th>
<th>Average Salary ( CTC) Rs. Lakhs per annum</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Tech.</td>
<td>11.72</td>
</tr>
<tr>
<td>B.Arch.</td>
<td>8.00</td>
</tr>
<tr>
<td>Dual Degree</td>
<td>9.67</td>
</tr>
<tr>
<td>5yr. Integrated M.Sc.</td>
<td>12.27</td>
</tr>
<tr>
<td>2yr. M.Sc.</td>
<td>9.77</td>
</tr>
<tr>
<td>M. Tech.</td>
<td>8.69</td>
</tr>
<tr>
<td>Ms/ Ph.D</td>
<td>7.85</td>
</tr>
<tr>
<td>Average Salary for all Courses</td>
<td>10.35</td>
</tr>
<tr>
<td>VGSOM ( MBA )</td>
<td>10.9</td>
</tr>
</tbody>
</table>
Some companies have offered pre placement offers like ITC Ltd., Schlumberger, Hindustan Unilever, Qualcomm, Barclays Capital, etc. Total number of P.P.O’s received are 103.

**Student Participation:** T&P Section at IIT Kharagpur has taken an initiative to harness the students’ management skills through a formal system during the placement season since 2005-2006. The system has progressed extremely well and from year 2010 onwards, the T&P has immensely benefitted from students participating in placement process. The organizational skill of students has helped T&P to conduct 12-15 companies’ placement interviews per day and round the clock. During the placement season students play an active role from contacting the companies to the final selection at campus by providing complete logistic support.

**Students’ Affairs**

Technology Students’ Gymkhana is the nerve center of the extra curricular activities of the students and is vibrant with various sports, socio-cultural and technological activities.

In the 48th Inter IIT Aquatic Meet held at IIT Roorkee, IIT Kharagpur secured over all 1st position. Extra ordinary performance in swimming by Darshan Varier was the highlight of the meet. In the Inter IIT Sports Meet, women athletics team and lawn tennis team secured 1st position. Ms. Sruthi Chekuri was declared individual champion in the women athletics meet. The men volleyball team secured 3rd position.

The Spring Fest ‘12 was organized in the month of January, 2012. This year participation from colleges from various parts of country was very good. The annual techno – management fest Kshitij ‘12 was also organized and a large number of participants form all over the country were present.

Like every year inter hall sports, socio – cultural as well as technology related competitions were held, where all the halls participated.

A large number of facilities have been added. Construction of a new students’ activity center is complete and operational.
Courses of Study

Aerospace Engineering
- B.Tech.- Aerospace Engineering
- Dual Degree - Aerospace Engineering
- Dual Degree - Aerospace Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Aerospace Engineering

Agricultural and Food Engineering
- B.Tech.- Agricultural & Food Engineering
- Dual Degree - Agricultural & Food Engineering/ Farm Machinery & Power
- Dual Degree - Agricultural & Food Engineering/Post Harvest Engineering
- Dual Degree - Agricultural & Food Engineering/Dairy & Food Engineering
- Dual Degree - Agricultural & Food Engineering/Food Process Engineering
- Dual Degree - Agricultural & Food Engineering/Aqua Cultural Engineering
- Dual Degree - Agricultural & Food Engineering/Agricultural Systems & Management
- Dual Degree - Agricultural & Food Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Farm Machinery and Power
- M. Tech. – Land and Water Resources Engineering
- M. Tech. – Food Process Engineering
- M. Tech. – Agricultural Biotechnology
- M. Tech. - Aquacultural Engineering
- M. Tech. - Agricultural Systems and Management

Architecture and Regional Planning
- B.Arch.
- Master of City Planning

Biotechnology
- B.Tech.- Biotechnology & Biochemical Engineering
- Dual Degree - Biotechnology & Biochemical Engineering
- Dual Degree - Biotechnology & Biochemical Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Biotechnology and Biochemical Engineering

Chemical Engineering
- B.Tech.- Chemical Engineering
- Dual Degree - Chemical Engineering
- Dual Degree - Chemical Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Chemical Engineering

Chemistry
- M.Sc. - Chemistry
- Joint M.Sc.- Ph.D. in Chemistry (with effect from 2009 admissions)

Civil Engineering
- B.Tech.- Civil Engineering
- Dual Degree - Civil Engineering/ Hydraulic & Water Resources Engineering
- Dual Degree - Civil Engineering/ Transportation Engineering
- Dual Degree - Civil Engineering/ Geotechnical Engineering
- Dual Degree - Civil Engineering/ Structural Engineering
- Dual Degree - Civil Engineering/ Environmental Engineering & Management
- Dual Degree - Civil Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
• M. Tech. - Hydraulic and Water Resources Engineering
• M. Tech. - Transportation Engineering
• M. Tech. - Environmental Engineering and Management
• M. Tech. - Geotechnical Engineering (Withdrawn due to less than 5 students admission)
• M. Tech. - Structural Engineering

**Computer Science and Engineering**
• B.Tech.- Computer Science & Engineering
• Dual Degree - Computer Science & Engineering
• Dual Degree - Computer Sc. & Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
• M. Tech. - Computer Science and Engineering

**Centre for Educational Technology**
• M. Tech. - Media and Sound Engineering

**Centre for Oceans, Rivers, Atmosphere and Land Sciences**
• M. Tech. - Earth System Science and Technology

**Cryogenic Engineering**
• M. Tech. - Cryogenic Engineering

**Electrical Engineering**
• B.Tech.- Electrical Engineering
• B.Tech.- Instrumentation Engineering
• Dual Degree - Electrical Engineering/ Machine Drives & Power Electronics
• Dual Degree - Electrical Engineering/ Control System Engineering
• Dual Degree - Electrical Engineering/ Power System Engineering
• Dual Degree - Electrical Engineering/ Instrumentation Engineering
• Dual Degree - Instrumentation Engineering/ Control Systems Engineering
• Dual Degree - Electrical Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
• Dual Degree - Instrumentation Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
• M. Tech. - Machine Drives and Power Electronics
• M. Tech. - Control System Engineering
• M. Tech. - Power and Energy Systems
• M. Tech. - Instrumentation

**Electronics and Electrical Communication Engineering**
• B.Tech.- Electronics & Electrical Communication Engineering
• Dual Degree - Electronics & Elect. Comm. Engineering/ Fibre Optics and Lightwave Engineering
• Dual Degree - Electronics & Elect. Comm. Engineering/ Microelectronics & VLSI Design
• M. Tech. - Fibre Optics and Light wave Engineering (not offered in the session 2008-2009)
• M. Tech. - Microelectronics and VLSI Design
• M. Tech. - RF and Microwave Engineering
• M. Tech. - Telecommunication Systems Engineering
• M. Tech. - Visual Information and Embedded Systems Engineering
Geology and Geophysics
- M.Sc. - Exploration Geophysics
- M.Sc. - Applied Geology
- Joint M.Sc.- Ph.D. in Geophysics (with effect from 2009 admissions)
- Joint M.Sc.- Ph.D. in Geology (with effect from 2009 admissions)
- M. Tech. - Exploration Geosciences
- M. Tech. - Computational Seismology (Withdrawn due to less than 5 students admission)

Humanities and Social Sciences
- M.Sc. - Economics
- Master of Human Resource Management

Industrial Engineering and Management
- B.Tech.- Industrial Engineering
- Dual Degree - Industrial Engineering/ Industrial Engineering & Management
- Dual Degree – Quality Engineering Design and Manufacturing
- Dual Degree - Industrial Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Industrial Engineering and Management

Materials Science

Mathematics
- M.Sc. - Mathematics & Computing
- Joint M.Sc.- Ph.D. in Mathematics (with effect from 2009 admissions)
- M. Tech. - Computer Science and Data Processing

Mechanical Engineering
- B.Tech.- Mechanical Engineering
- B.Tech.- Manufacturing Science & Engineering
- Dual Degree - Mechanical Engineering/ Manufacturing Science and Engineering
- Dual Degree - Mechanical Engineering/ Thermal Science and Engineering
- Dual Degree - Mechanical Engineering/ Mechanical Systems Design
- Dual Degree - Mechanical Engineering/ Mechanical Systems, Dynamics & Control
- Dual Degree - Manufacturing Science & Engineering/ Industrial Engineering & Management
- Dual Degree - Mechanical Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- Dual Degree - Manufacturing Science & Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Manufacturing Science and Engineering
- M. Tech. - Thermal Science and Engineering
- M. Tech. - Mechanical Systems Design

Metallurgical and Materials Engineering
- B.Tech.- Metallurgical and Materials Engineering
- Dual Degree - Metallurgical & Materials Engineering
- Dual Degree - Metallurgical & Materials Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Metallurgical and Materials Engineering
- Master of Steel Technology

Mining Engineering
- B.Tech.- Mining Engg.
- Dual Degree - Mining Engineering/ Mining Engineering
- Dual Degree - Mining Engineering/ Safety Engineering and Disaster Management
- Dual Degree - Mining Engineering/ MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Mining Engineering

**Ocean Engineering and Naval Architecture**
- B.Tech.- Ocean Engineering and Naval Architecture
- Dual Degree - Ocean Engineering & Naval Architecture
- Dual Degree - Ocean Engineering & Naval Architecture/MBA/Engineering Entrepreneurship/ Financial Engineering
- M. Tech. - Ocean Engineering and Naval Architecture

**Physics and Meteorology**
- M.Sc. - Physics
- Joint M.Sc.- Ph.D. in Physics
- M. Tech. - Solid State Technology

**Rajendra Mishra School of Engineering Entrepreneurship**
- Dual Degree - B.Tech. in Parent Dept/ Entrepreneurship Engineering

**Rajiv Gandhi School of Intellectual Property Law**
- Bachelor of Laws - Intellectual Property Rights (3 Years)

**Ranbir & Chitra Gupta School of Infrastructure Design and Management**
- M. Tech. - Infrastructure Design and Management

**Reliability Engineering**
- M. Tech. - Reliability Engineering

**Rubber Technology**
- M. Tech. - Rubber Technology

**School of Information Technology**
- M. Tech. - Information Technology
- M. Tech. – Information and Communication Technology

**School of Medical Science and Technology**
- Master of Medical Science and Technology (3 Years)
- M.Tech – Medical Imaging and Image Analysis (Withdrawn due to less than 5 students admission)

**School of Water Resources**
- M. Tech. - Water Management

**Vinod Gupta School of Management**
- MBA - Business Administration (2 Years)
- Executive MBA (3 Years)

**Distance Mode (Kolkata & Bhubaneswar Centre) (3 Years)**
- M.Tech - Electronics and Communication Engineering
- M.Tech - Electrical Engineering
- M.Tech - Information and Communication Technology
Department of Aerospace Engineering

Head
Prof. Kalyan Prasad Sinha Mahapatra

Professors
Bandyopadhyay, Gautam  Ph.D.(IIT Kharagpur), Computational Aerodynamics Experimental Aerodynamics
Datta, Prosun Kumar  Ph.D.(Georgia Tech), Aerospace Structures
Singh, Bhrigu Nath  Ph.D.(IIT Kanpur), Aerospace and Smart Composite Structures, Uncertainty Quantification in Aircraft Analysis & Design, Multi-scale Modelling, FGM Plates and Shells, Adaptive Nonlinear FEM
Singh, Navtej  Ph.D.(IIT Kharagpur),
Sinha Mahapatra, Kalyan Prasad  Ph.D.(IIT Kharagpur), Computational Fluid Dynamics, Aeroacoustics, Large Eddy Simulation, Fluid-Structure Interaction

Associate Professors
Laha, Manas Kumar  Ph.D.(IIT Kharagpur), computational fluid dynamics and flight mechanics
Maiti, Dipak K  Ph.D.(IIT Kharagpur), Aerospace Structures, Composite and Smart Structures, Structural Dynamics & Aeroelasticity, Design & Development of MR fluid damper & Landing Gear Dynamics, Structural Health Monitoring
Pradhan, Suresh Chandra  Ph.D.(IIT Kanpur), Aerospace structures, Nonlocal elasticity, FEM, FGM, Smart Structures, composite materials and nano-composites, Optimization

Assistant Professors
Ghosh, Anup  Ph.D.(IIT Kharagpur), Aerospace Structures, Composite Structures, Micro Air Vehicle
Roy, Arnab  Ph.D.(IIT Kharagpur), Aerodynamics, Computational Fluid Dynamics
Sinha, Manoranjan  Ph.D.(IIT Kanpur), Flight Dynamics Controls System-Identification Neural Networks

Faculty Appointments
Naba Kumar Peyada  Assistant Professor
Somnath Ghosh  Assistant Professor
Ratan Joarder  Assistant Professor
Manoranjan Sinha  Associate Professor
Arnab Roy  Associate Professor
Srinibas Karmakar  Assistant Professor
Mrinal Kaushik  Assistant Professor

Faculty Retirement
Rao, T. V.  Associate Professor
Gautam Bandyopadhyay  Professor (expired)
Faculty Re-employment
Datta, Prosun Kumar Professor

Brief Description of on-going activities


Thrust Areas

1. Computation of High-Speed High-Temperature Reactive Flows, Turbulent flow and large-eddy simulation, Combustion, Composite and smart structures, probabilistic analysis & design, Autonomous reconfigurable flight vehicle development and Chandrayaan-I project

New Acquisitions

1. IBM X3755 M3 Server with 4 AMD Opteron 12 core 6220 processors (48 cores), 2.4 GHz, 16 MB L3 cache, 256 GB DDR3 @ 1333 MHz for Departmental Computer Laboratory
2. Digital Protractor (Angle Indicator), Model: PRO-3600, Make: Smart Tools Technology, USA to be used for wind tunnel model setting in Aerodynamics Lab
3. ePIV System including hardware and FLOWEX Software. Make: Interactive Flow Studies Corporation, USA. It is an educational Particle Image Velocimetry System meant for Laboratory demonstrations in Aerodynamics Laboratory.

Doctoral and MS Degrees Awarded

1. A. K. Rajesh : Aircraft Parameter Estimation(Ph.D.)
2. Kalyan Kumar Das : Experimental and Large-eddy simulation of thunderstorm downburst(Ph.D.)
3. Shravankumar B. Kerur : Geometrically Nonlinear Static and Dynamic Analysis of Piezoelectric Fiber Reinforced Composite Plates and Shells(Ph.D.)
4. Md. Talha : An Improved Structural Kinematics for Thermoelastic analysis of FGM Plates with random mMaterial Properties(Ph.D.)

Member - Professional Bodies

1. Pradhan, Suresh Chandra, Member - ISSS
2. Pradhan, Suresh Chandra, Member - Computational Mechanics India
3. Pradhan, Suresh Chandra, Member - IE(I)
4. Pradhan, Suresh Chandra, Member - Aeronautical Society of India
5. Maiti, Dipak K, Member - Institution of Engineers (India)
6. Maiti, Dipak K, Member - Aeronautical Society of India
7. Singh, Bhrigu Nath, Life - ISTE, India
8. Datta, Prosun Kumar, Senior Member - Japan Soc. of Aeronautical and Space Sciences
9. Bandyopadhyay, Gautam, - Aeronautical Society of India
10. Sinha Mahapatra, Kalyan Prasad, Member - Aerospace Resources Panel of AR&DB
11. Sinha Mahapatra, Kalyan Prasad, Life - Aeronautical Society of India
12. Sinha Mahapatra, Kalyan Prasad, Life - Wind Engineering Society of India
13. Sinha Mahapatra, Kalyan Prasad, Member - Aerodynamics Panel of AR&DB
14. Sinha Mahapatra, Kalyan Prasad, Fellow - Institute of Engineers

**Member - Editorial Board**

1. Datta, Prosun Kumar (2010) Member, Editorial Board - Int J. of Structural Stability and Dynamics
6. Pradhan, Suresh Chandra (2010) Member - IJVSS
7. Pradhan, Suresh Chandra (2010) Member - IJETAETS

**Sponsored Research Projects**

1. Aerodynamic design of traction rolling stock with speed potential of 250 km/h (CRR, Indian Railways, Rs.600.00 Lakhs)
2. Aerodynamics modeling of chaff bloom (DRDO, Defence Laboratory, Jodhpur, Rs.9.78 Lakhs)
4. Analysis and Development of Conceptual Design Methodologies for Air Collection and Enrichment System of Air Breathing Propulsion -Phase II (IIT – ISRO KCSTC, Rs.5.00 Lakhs)
5. Boeing University Relations, IIT Kharagpur- Campus Engagement Plan (Boeing Co., USA, Rs.23.50 Lakhs)
6. Damage Assessment of Aircraft Structures From Limited Vibration Data (AR&DB, New Delhi, Rs.8.45 Lakhs)
7. Estimation of Acoustic Load in MCA weapon bay and Hinge moment on the doors (ADA, Rs.17.28 Lakhs)
9. Large Eddy Simulation of AURA-type Flying Wing Configurations with Dragerons at Operating Speed Range (ADA, Bangalore, Rs.70.20 Lakhs)
10. Large-Eddy Simulation of Transonic and Supersonic Cavity Flow Fields (AR & DB, Rs.8.43 Lakhs)
11. Least square finite element analysis of adhesively bonded joint (AR &DB, Rs.4.45 Lakhs)
13. Setting up of AR & DB Associate Centre for CFD at IIT Kharagpur (Aeronautical Research & Development Board, Rs.0.00 Lakhs)
14. Study of Flow Structure and Associated Accoustics in Weapon Bay Cavity using LES (ADA, Bangalore, Rs.8.16 Lakhs)
15. Uncertainty Quantification in Aircraft Analysis and Design (AR & DB, DRDO, New Delhi, Rs.27.58 Lakhs)
16. Upgradation of the Associate Node for CFD at IIT Kharagpur (AR & DB, Rs.40.89 Lakhs)

**Consultancy Projects**

1. Wind tunnel testing of scaled down railway locomotives (HEWPL, Rs.1.21 Lakhs)
Visits Abroad by Faculty Members

1. Sinha Mahapatra, Kalyan Prasad - Attending conference (Amsterdam, The Netherlands) 4 days
2. Sinha Mahapatra, Kalyan Prasad - Attending conference (Tokyo, Japan) 4 days

Invited Lectures by Faculty Members

1. Simulation of dry downbursts by Sinha Mahapatra, Kalyan Prasad (Guwahati)
2. CFD activities at the ARDB associate centre at IIT Kharagpur by Sinha Mahapatra, Kalyan Prasad (Bangalore)

Papers Published in Journals


Papers Presented in Conferences


2. CFD analysis of the energy separation in a Ranque-Hilsch vortex tube (RHVT), By Bej Nilotpala and Sinhamahapatra K.P., 14th CFD Symposium, Bangalore, (2012)


5. Flow field studies over V-shaped rear face cavities at supersonic speed, By Srinivasan G., Sinhamahapatra K.P. and Das S., 14th CFD Symposium, Bangalore, (2012)

6. Numerical Investigation of Three Dimensional Cavity Flow, with a Curved Base, using Space-Time Conservation and Solution Element Method, By Poonkodi S., Srinivasan G., and
Sinhamaapatra K.P. *WORLD CONGRSS on Frontiers of Mechanical, Aeronautical and Automobile Engineering (WCFMAAE-2013)*, New Delhi, (2013)

Department of Agricultural & Food Engineering

Head
Prof. P B Singh Bhadoria

Professors
Banerjee, Rintu  
*Ph.D.(IIT Kharagpur)*, Food Biotechnology, Bioenergy, Enzymology & its Biotechnological applications, Protein Chemistry

Bhadoria, P B Singh  
*Ph.D.(IIT Kharagpur)*, Development and transfer of rural technology, Soil Science & Plant nutrition

Das, Susanta Kumar  
*Ph.D.(IIT Kharagpur)*, Mechanized Food Processing and Food Engineering

Datta, Ashis Kumar  
*Ph.D.(Pennsylvania)*, Dairy and Food Process Engineering

Dutta Gupta, Snehasish  
*Ph.D.(Kalyani Univ)*, Plant Tissue Culture & Biotechnology

Ghosh, Bijoy Chandra  
*Ph.D.(IIT Kharagpur)*, Soil less culture Organic farming Tea production and processing

Goswami, Tridib Kumar  
*Ph.D.(IIT Kharagpur)*, Cold Storage, CA and MA storage of fruits and vegetables, Cryogenic grinding of spices, Discrete Element Analysis of grinding, CFD analysis of temperature distribution in precooler

Jha, Madan Kumar  

Mal, Bimal Chandra  
*Ph.D.(IIT Kharagpur)*,

Mallick, Nirupama  
*Ph.D.(BHU, Varanasi)*, Microalgal Biofuel, Biodegradable Polymers (Polyhydroxyalkanoates) from Cyanobacteria, Bioremediation with Microalgae, Bioactives from Microalgae

Mishra, Hari Niwas  
*Ph.D.(IIT Kharagpur)*, Algal Food Biotechnology, RTE Health Foods & Nutraceuticals, Innovative Food Processing Technologies, Horticultural & Plantation Crop Products Processing, Food Safety & Quality Control, High pressure processing of high value perishables

Panda, Rabindra Kumar  
*Ph.D.(IARI Delhi)*, Watershed Management, Non-point Source Pollution of Soil & Water, Climate Change Effect on Agriculture, Rainwater Management

Panda, Sudhindra Nath  
*Ph.D.(PAU, Ludhiana)*, Integrated Land and Water Resources Planning and Management, Rainwater Conservation and Recycling

Pandey, Keshaw Prasad  
*Ph.D.(IIT Kharagpur)*, 1 Tractor power systems 2. Traction modelling 3. Precision agriculture

Raghuwanshi, Narendra Singh  
*Ph.D.(California)*, Irrigation and Water Management, Hydrological Modelling, Watershed Management

Raheman, Hifjur  
*Ph.D.(Bangkok)*, Development of farm Implements, Biofuel production and hybrid power generation

Singh, Rajendra  
*Ph.D.(IIT Kharagpur)*, Hydrological Modelling, Irrigation System Management

Tewari, Virendra Kumar  
*Ph.D.(IIT Kharagpur)*, Farm Machinery & Power, Ergonomics & Safety, Precision Agriculture

Tiwari, Kamlesh Narayan  
## Associate Professors

<table>
<thead>
<tr>
<th>Name</th>
<th>Qualification/University</th>
<th>Research Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Das, Bhabani Sankar</td>
<td>Ph.D (Kansas)</td>
<td>Spectral characterization of soils, Rice hydrology, Measurement and modeling of water and nutrient status in soil, Pedotransfer functions</td>
</tr>
<tr>
<td>Majumdar, Gautam Chandra</td>
<td>Ph.D (IIT Kharagpur)</td>
<td>Food Process Engineering</td>
</tr>
<tr>
<td>Mitra, Adinpunya</td>
<td>Ph.D (East Anglia UK)</td>
<td>Bioarchitecture of Gentianaceae medicinal plants for phenolic bioactives, Regulation of shikimate/phenylpropanid and MVA/MEP pathways in hairy root cultures of Daucus carota, Biochemistry and molecular biology of floral scent volatiles, Biochemistry of phenolic fragrance Hemidesmus indicus roots and cell cultures, Targeted metabolite profiling of phenolic compounds in transgenic root cultures and plants</td>
</tr>
<tr>
<td>Mitra, Arunabha</td>
<td>Ph.D (Calcutta Univ)</td>
<td>Value based education, Waste utilization in aquaculture, Ecology and environmental pollution, Chemical-free farming, Mind and consciousness, Stress management and control</td>
</tr>
<tr>
<td>Srinivasa Rao, Pavuluri</td>
<td>Ph.D (IIT Kharagpur)</td>
<td>Recirculatory Aquacultural Systems, Post Harvest &amp; Food Engineering, High Pressure Processing of High Value Perishable Commodities</td>
</tr>
<tr>
<td>Thomas, E V</td>
<td>Ph.D (IIT Kharagpur)</td>
<td>Farm Machinery &amp; Power, Rice Transplanter, Tea Process Machinery</td>
</tr>
</tbody>
</table>

## Assistant Professors

<table>
<thead>
<tr>
<th>Name</th>
<th>Qualification/University</th>
<th>Research Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Das, Madhusweta</td>
<td>Ph.D (Jadavpur Univ)</td>
<td>Functional Foods, Starch based edible and biodegradable film, Isolation of bioactive component from food waste</td>
</tr>
<tr>
<td>Mishra, Ashok</td>
<td>Ph.D (IIT Kharagpur)</td>
<td>Hydrological modelling &amp; Watershed management, Crop yield modelling, Climate change analysis &amp; applications in water and crop management</td>
</tr>
<tr>
<td>Mukherjee, Chanchal Kumar</td>
<td>MS (New Jersey)</td>
<td>Cage for mariculture</td>
</tr>
<tr>
<td>Nalavade, Parish Prakash</td>
<td>D. Eng. (A I T, Thailand)</td>
<td>Tillage and Traction, Soil-Tool Interaction, Precision Agriculture</td>
</tr>
<tr>
<td>Shrivastava, Shanker Lal</td>
<td>Ph.D (IIT Kharagpur)</td>
<td>Post Harvest Engineering, Dairy &amp; Food Process Engineering, Development of low cost - farm level processing equipment</td>
</tr>
<tr>
<td>Srivastav, Prem Prakash</td>
<td>Ph.D (IIT Kharagpur)</td>
<td>Food Science and Technology</td>
</tr>
<tr>
<td>Swain, Dillip Kumar</td>
<td>Ph.D (IIT Kharagpur)</td>
<td>Sustainable &amp; Precision Production Agriculture, Climate Change Adaptations &amp; Mitigations, Crop Growth &amp; Yield Simulation</td>
</tr>
<tr>
<td>Tripathy, Punyadarshini Punam</td>
<td>Ph.D (IIT Delhi)</td>
<td>Heat and Mass transfer during drying of food products, Mathematical modeling and simulation in food drying process, CO2 mitigation in solar dryers, CO2 capture and storage</td>
</tr>
</tbody>
</table>

## Senior Scientific Officer

<table>
<thead>
<tr>
<th>Name</th>
<th>Qualification/University</th>
<th>Research Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singh, Manindra Nath</td>
<td>Ph.D (BHU)</td>
<td>Grain Storage Technology</td>
</tr>
</tbody>
</table>

Faculty Retirement
Singh, Manindra Nath          Senior Scientific Officer

Brief Description of on-going activities

Application of GIS in both command area & watershed management, Application of neural network in hydrology, Ballast management of agricultural tractors, Biofiltration Technology, Bio-fuels from tree-based oils, Biosynthesis of phenolic fragrance and xanthones, Cage for mariculture, Climate change analysis & applications in water and crop management, Coal biotechnology, Design and development of continually variable transmission for tractors, Design, development and field evaluation of a small power tractor, Design and development of slip meter for two-wheel drive tractors, Design and development of automatic depth control system for tractors, Design and development of ergo NVH_ag 1.0 software, Design and development of noise and vibration reducing device for hand tractor, Design and development of noise and vibration reducing device for vertical conveyor reaper, Design of a centrifugal press for semi-continuous production of paneer, Development of aseptic packaging system for milk, Development of environment-friendly aquaculture, Development of food products, Development of machineries and process technology for cereals & pulses based snacks, Development of rice transplanter, Development of a continuous chhana making device, Development of jacketted scraped surface vessel for kneading, heating and concentration of high viscosity liquids and pastes, Development of endless chain pressure dryer for orthodox tea, Design of a centrifugal press for semicontinuous production of paneer, Development of Cashew nut sheller and Cashew peeler, Evaluation of cosmetic properties of Aloe vera L., Flow and solute transport in sub-surface environment, Food Packaging, High pressure processing of high value perishables, Hydrological modelling of small watersheds, Imaging photosynthesis of micropropagated plants, Integration of surface irrigation and two-dimension infiltration model, Machinery systems and ergonomics, Microalgal biofuel, Microbial degradation of plant phenolics for value-added products, Micropropagation and cryopreservation of endangered medicinal plants, Microwave assisted drying of high moisture food, Nutrient management, Polyhydroxyalkanoates from Cyanobacteria, Predicting traction performance using artificial neural network, Process technology for dehydration of mushrooms, Production and processing of tea, Production of tannase under solid state fermentation, Process technology for dahi powder & dahi powder based energy drink mix, Process technology for antioxidant rich RTE health food, Process technology for manufacture of RTE health food (herbal kurkure), Rainwater harvesting and groundwater recharge, Software development for machinery management, Spectral characterization of soils, Starch based edible and biodegradable film, Thermal analysis of food materials, Traction potential of bias-ply tyres used in agricultural tractors, Water quality and watershed management

Thrust Areas

1. Agricultural Biotechnology
2. Agro-Informatics
3. Mechanized Food Processing
4. Natural Resources Management
5. Precision Farming

New Acquisitions

1. Atomic Absorption Spectrometer, ThermoFisher Scientific
2. Flash 2000 CHNS Analyzer, ThermoFisher Scientific
3. GC-MS-HeadSpace System, CLARUS 600T, Perkin Elmer

International Collaborations

Technical University of Braunschweig, Germany
Department of Geoinformatics, Geohydrology and Modeling, Friedrich-Schiller-University, Jena, Germany

Biosystems Engineering Department, College of Agriculture, Sam Ginn College of Engineering, Auburn University, USA

Institute of Water Resources Management, Hydrology and Agricultural Hydraulic Engineering, Leibniz University Hannover, Germany

ALTERRA-Centre for Water and Climate, Wageningen University, The Netherlands

Waikato Institute of Technology, Hamilton, New Zealand

Institute of Biological Sciences, University of Rostock, Rostock, Germany

United Nations University, Tokyo, Japan (Collaborator: Prof. Srikantha Herath): Research and education, Network on climate change adaptation research

MoU Agreement: Signed MoU as Focal Point for 'University Network for Climate and Ecosystem Change Adaptation Research (UNCECAR)', with United Nations University, Tokyo, JAPAN

Dr. Thomas Crawford, Department of Geography, East Carolina University, Greenville, NC USA 27858 USA. Under a scoping project-"Human Responses to Catastrophic Monsoon Events in South Asia: Designing a Spatially Explicit Model in Low-Lying Coastal Bangladesh and India" funded by Asian Pacific Network for Global Change Research (APN).

The Coordinated Climate-Crop Modeling Project, USA (Collaborators: Dr. Cynthia Rosenzweig, NASA-Goddard Institute for Space Studies and Columbia University, USA, Agricultural Model Intercomparison and Improvement Project): Research, Analysis of uncertainty in the agricultural impacts of climate change

Lectures by Visiting Experts

1. Teaching and Research in Agricultural Engineering at University of Southern Queensland, Australia by Dr. R.K. Mishra (University of Southern Queensland, Australia)
2. Heart Management: Sharing Personal Experience by Prof. Jaswant Singh, Former Head, AgFE (Varanasi)
3. Extraction of Bioactive Components, Food and Bioprocess Engineering, Ultrasonic Treatment and Radio Frequency Enhanced Solvent Extraction by Dr. Oon-Doo Baik (Chemical and Biological Engineering, University of Saskatchewan, Saskatoon, Canada)
4. Making Processed Food Healthier - A Study on Incorporation of Fiber in Extruded Products by Dr. Sajid Alavi (Department of Grain Science and Industry, Kansas State University, USA)
5. Bioresource Engineering at McGill and Post Harvest Technology for Sustainable Food Security by Dr. G S Vijay Ragavan (Department of Bio-Resource Engineering, McGill University, Canada)

Doctoral and MS Degrees Awarded

1. Sushil Kr. Pandey: Modified Atmospheric packaging of capsicum (Ph.D)
2. Pramod Tiwary: Development and evaluation of decision support for integrated water resource management (Ph.D.)
3. Narayan Bag: Performance of Indian major crops cultured with different stocking densities and management practices (Ph.D)
4. Ajay Singh: Optimization and simulation modeling for managing waterlogging in semi-arid region of Haryana, India (Ph.D)
5. Amit Baran Das: Production of rice snacks by using a single screw extruder (MS)
6. Sourya Das: Utilization and management of wetland resources in West Bengal (Ph.D.)
7. Abhinav Mishra: Moisture sorption isotherms of pigeonpea (Cajanus cajan) and its thermodynamic properties (MS)
8. Sangeeta Mukhopadhyay: Optimization of process parameters for the production of chhana podo (MS)
9. Chandani Sen: Active packaging of fresh Singapuri banana (MS)
10. Chhaya: Processing of stevia extract using membrane separation technology (Ph.D.)
11. Nandede Balaji Murhari: Development of tractor drawn multi-stack automatic vegetable transplanter (Ph.D.)
12. A.K. Srivastava: Design of universal mounting fixture and deployable roll-over protective structure for 2WD Agricultural Tractors (Ph.D.)
13. Debajit Datta: Criteria and indicators for assessing sustainable community management of Sunderbans mangroves, India (Ph.D.)
14. Tanima Choudhury: Development of starch based self supporting edible films and their characterization (Ph.D.)
15. Sudipto Sarkar: Development of water quality model for culture of Indian major crops (Ph.D.)
16. Ranjana Bhati: Poly (3-hydroxybutyrate-co-3-hydroxyvalerate) co-polymer production by the nitrogen fixing Cyanobacterium Nostoc muscerum Agardh (Ph.D.)
17. Shilalipi Samantaray: Production of polyhydroxyalkanate polymers using a Rice-field cyanobacterium Aulosira fertilissima (Ph.D.)
18. C.K. Raju: Enhancing sustainability and secureness of software in public applications (Ph.D.)
19. Ranjana Pandey: Studies on safe storage of green gram (Vigna radiata) (Ph.D.)

**Member - Professional Bodies**

1. Mallick, Nirupama, *Regular* - Life Member: Biotech Research Society of India
2. Mitra, Adinpunya, *Life Member* - Society for Plant Biochemistry and Biotechnology (India)
3. Mitra, Adinpunya, *Life member* - Association of Microbiologists of India
4. Mitra, Adinpunya, *Life Member* - Biotech Research Society of India
5. Das, Madhusweta, *Regular* - American Society of Agricultural and Biological Engineers
6. Singh, Manindra Nath, *Senior Member* - Bioved research society Allahabad
7. Guha, Proshanta, *Life member* - Indian Society of Weed Science
8. Guha, Proshanta, *Life Member* - Association of Rice Research Workers
9. Guha, Proshanta, *Regular* - Association of food scientists and technologists (India)
10. Guha, Proshanta, *Life member* - Indian Science Congress Association
11. Guha, Proshanta, *Life Member* - Indian Society of Plant Physiology
12. Srivastav, Prem Prakash, *Life Member* - IDA
13. Srivastav, Prem Prakash, *MTIE* - Institution of Engineers
14. Srivastav, Prem Prakash, *Member* - American Society of Agricultural and Biological Engineers
15. Srivastav, Prem Prakash, *Life member* - Association of Microbiologists of India
16. Srivastav, Prem Prakash, *Life Member* - ISTE
17. Srivastav, Prem Prakash, *Life Member* - AFST(I)
18. Shrivastava, Shanker Lal, *Life Member* - Association of Food Scientists and Technologists (India)
20. Srinivas Rao, Pavuluri, *Member* - Institution of Engineers (India)
22. Srinivas Rao, Pavuluri, *Members* - Institute of Food Technologists (USA)
23. Srinivas Rao, Pavuluri, *Life member* - Association of Food Scientists and Technologists
24. Srinivas Rao, Pavuluri, *Member* - American Society of Agricultural and Biological Engineers
26. Swain, Dillip Kumar, *Life member* - Indian Society of Agronomy
27. Swain, Dillip Kumar, *Member* - American Society of Agronomy
28. Swain, Dillip Kumar, *Life member* - Indian Science Congress Association
29. Swain, Dillip Kumar, *Member* - International Society for Environmental Information Sciences
30. Mishra, Ashok, **Member** - Environmental & Water Resources Institute (EWRI), American Society of Civil Engineers (ASCE)
31. Mishra, Ashok, **Life Member** - Indian Society of Agricultural Engineers.
32. Mishra, Ashok, **Life Member** - Indian Water resources Society (IWRS)
33. Pandey, Keshaw Prasad, **Member** - The Institution of Engineers (India)
34. Pandey, Keshaw Prasad, **Member** - American Society of Agricultural and Biological Engineers
35. Pandey, Keshaw Prasad, **Life Member** - Indian Society of Agricultural Engineers
36. Bhadoria, P B Singh, **Life memeber** - Indian Society of Soil science
37. Bhadoria, P B Singh, **senior** - Agril. Engg soicety, IIT kharagpur
38. Bhadoria, P B Singh, **Annual Member** - German Society of plant nutrition and soil science
39. Mukherjee, Chanchal Kumar, **Regular** - Society of Naval Architects & marine Engineers USA
40. Mukherjee, Chanchal Kumar, **regular** - Society of Fisheries technologists of India
41. Mukherjee, Chanchal Kumar, **regular** - Institution of Engineers India
42. Mukherjee, Chanchal Kumar, **Associate member** - Aquaculture Engineering society, USA
43. Mukherjee, Chanchal Kumar, **Member** - World Aquaculture Society
44. Tiwari, Kamlesh Narayan, **Life Member** - Indian Water Resources Society
45. Tiwari, Kamlesh Narayan, **Regular Member** - American Society of Agricultural and Biological Engineers
46. Tiwari, Kamlesh Narayan, **Life Member** - Indian Society of Agricultural Engineers
47. Tiwari, Kamlesh Narayan, **Life Member** - Indian Society of Remote Sensing
48. Tiwari, Kamlesh Narayan, **Senior Member** - Institution of Engineers (India)
49. Mitra, Arunabha, **Life Member** - Zoological Society of India
50. Mitra, Arunabha, **Regular** - World Aquaculture Society, USA
51. Mitra, Arunabha, **Life Member** - Inland Fisheries Society of India
52. Mitra, Arunabha, **Full Founding Member** - Asian Fisheries Society, Philippines
53. Mitra, Arunabha, **Member** - Research Advisory Committee, Central Institute of Fisheries Education, ICAR, Govt. of India
54. Mitra, Arunabha, **Life Member** - Indian Science Congress
55. Mitra, Arunabha, **Member** - Board of Studies, Aquaculture Management & Technology, Vidyasagar University, Midnapore
56. Das, Susanta Kumar, **Regular** - American Society of Agricultural and Biological Engineers, USA
57. Ghosh, Bijoy Chandra, **Life Member** - Indian Society of Agronomy
58. Ghosh, Bijoy Chandra, **Life Member** - Indian Society of Weed Science
59. Datta, Ashis Kumar, **Member** - American Society of Agricultural and Biological Engineers (ASABE)
60. Datta, Ashis Kumar, **Life Member** - Indian Dairy Engineers Association (IDEA)
61. Datta, Ashis Kumar, **Ordinary** - Indian Dairy Association (IDA)
62. Datta, Ashis Kumar, **Life Member** - All India Council for Technical Education (AICTE)
63. Singh, Rajendra, **Life Member** - ISAE
64. Thomas, E V, **Associate Member** - Institution of Engineers (India)
65. Thomas, E V, **Regular Member** - Indian Society of Agricultural Engineers
66. Thomas, E V, **Regular Member** - American Society of Agricultural and Biological Engineers
67. Goswami, Tridib Kumar, **Life** - Indian Association of Chemical Engineers (AIChE)
68. Goswami, Tridib Kumar, **Life** - Indian Society of Cryogenic Engineers
69. Goswami, Tridib Kumar, **Life** - Association of Food Scientists and Technologists (AFST)
70. Goswami, Tridib Kumar, **Regular** - American Society of Agricultural and Biological Engineers (ASABE)
71. Tewari, Virendra Kumar, **Regular** - Indian Society of Weed Science
72. Tewari, Virendra Kumar, **Regular** - Association of Food Scientists and Technology (India)
73. Tewari, Virendra Kumar, **Regular** - Indian Society of Ergonomics
74. Tewari, Virendra Kumar, **Regular** - Indian Society for Technical Education
75. Tewari, Virendra Kumar, **Regular** - American Society of Agricultural and Biological Engineers
76. Dutta Gupta, Snehasish, **Regular** - European Federation of Biotechnology
77. Dutta Gupta, Snehasish, **Life** - Indian Society for Plant Physiology
78. Dutta Gupta, Snehasish, **Fellow Member** - Plant Tissue Culture Association (India)
79. Dutta Gupta, Snehasish, **Regular** - Society for In Vitro Biology, USA
80. Panda, Rabindra Kumar, Life Member - Indian Society of Agricultural Engineers
81. Panda, Rabindra Kumar, Life Member - Indian Society of Water Management
82. Panda, Rabindra Kumar, Life Member - Asia Pacific Association of Hydrology and Water Resources
83. Panda, Rabindra Kumar, Life Member - Indian Society of Agro-meteorologist
84. Panda, Rabindra Kumar, Associate Member - American Society of Agricultural and Biological Engineers
85. Mishra, Hari Niwas, Past President & Life Member - Association of Food Scientists & Technologists (India)
86. Mishra, Hari Niwas, Member - All India Food Processors Association
87. Mishra, Hari Niwas, Member - Indian Society of Agricultural Engineers
88. Raheman, Hifjur, Member - Member of the American Society of Agricultural & Biological Engineers
89. Raheman, Hifjur, Life Member - Indian Society of Agricultural Engineers
90. Raheman, Hifjur, Fellow - Institution of Engineers India
91. Jha, Madan Kumar, Life Member - Indian Science Congress Association, Kolkata
92. Jha, Madan Kumar, Regular Member - International Association of Hydrogeologists (IAH), U.K.
93. Das, Bhabani Sankar, Member - Indian Society of Soil Science
94. Tripathy, Punyadarshini Punam, Life member - Indian Society of Agricultural Engineers

**Member - Editorial Board**

1. Das, Madhusweta (0) Member - International Journal of Chemoinformatics and Chemical Engineering
2. Das, Madhusweta (2011) Editor - Research and Reviews: Journal of Agricultural Science and Technology
3. Das, Madhusweta (2011) Editor - Research and Reviews: Journal of Food Science and Technology
5. Dutta Gupta, Snehasish (2011) Associate Editor - Journal of Crop Science
7. Dutta Gupta, Snehasish (2011) Editorial Board Member - Journal of Biological Research (Hong Kong)
9. Goswami, Tridib Kumar (0) Editorial Board Member - The Standard International Journals (The SIJ)
10. Guha, Proshanta (2011) Member of Editorial Board - Research & Reviews: Journal of Agricultural Science and Technology
11. Guha, Proshanta (2011) Member of Editorial Board - Research & Reviews: Journal of Food Science and Technology
15. Mishra, Hari Niwas (0) Member - Indian Food Packer
17. Mishra, Hari Niwas (0) Member - Journal of Food Science & Technology
19. Mishra, Hari Niwas (0) Member - Fresh Produce
21. Mishra, Hari Niwas (0) Member - Food
22. Mishra, Hari Niwas (0) Member - Indian Food Industry
24. Panda, Rabindra Kumar (2012) *Editorial Board Member* - International Journal of Agricultural and Biological Engineering

**Awards & Honours**

1. Jha, Madan Kumar (2013) *Commendation Medal by the Indian Society of Agricultural Engineers*
2. Tiwari, Kamlesh Narayan () *Commendation Medal from Indian Society of Agricultural Engineers*
5. Tiwari, Kamlesh Narayan (2012) *Harikrishna Shastri Memorial Award of IARI for Outstanding Research in Micro Irrigation and Greenhouse Technologies*
7. Srinivasa Rao, Pavuluri (2012) *Member, Board of studies (Agril. Engg.), Jawaharlal Nehru Technological University, Hyderabad*
8. Mishra, Hari Niwas (2012) *Member, Board of Studies in Food Technology, Bigyan University, AP, India*
9. Jha, Madan Kumar (2012) *Prof. S.C. Puranic Award by the Association of Geologists and Hydrogeologists (GEOFORUM)*

**Fellowships**

1. Mitra, Adinpunya (2012) *DAAD Scholarship*

**Sponsored Research Projects**

1. A value chain on aloe vera processing (ICAR, New Delhi under NAIP of World Bank, Rs.385.65 Lakhs)
2. Adaptation to changing water resources availability in northern India with Himalayan glacier retreat and changing monsoon pattern (European Commission, Rs.155.00 Lakhs)
3. Advanced Agro-techniques for Improving Productivity of Tea Garden (Tea Board, Govt. of India, Kolkata, Rs.12.48 Lakhs)
4. AICRP on Ergonomics & Safety in Agriculture (ICAR, New Delhi, Rs.126.24 Lakhs)
5. AICRP on Farm Implement and Machinery (ICAR, New Delhi, Rs.140.78 Lakhs)
6. AICRP on Post Harvest Technology (Indian Council of Agricultural Research, Rs.14.00 Lakhs)
7. Analysis of Climate Change and its Impact on Flood and Drought in a River Basin (Sponsored Research and Industrial Consultancy (SRIC), IIT Kharagpur, Rs.3.15 Lakhs)
8. Assessment of harvest and post harvest losses of major crops and commodities in India (ministry of Food Processing Industries, New Delhi, Rs.6.40 Lakhs)
9. Assessment of harvest and post harvest losses of major crops and commodities in India (Ministry of Food Processing Industries, New Delhi, Rs.6.50 Lakhs)
10. Assessment of harvest and post harvest losses of major crops and commodities in India (AHM) (Ministry of Food Processing Industries, New Delhi, Ministry of Food Processing Industries, Rs.640000.00 Lakhs)
11. Award of Fellowship under National Renewable Fellowships (MNRE, Rs.61.76 Lakhs)
12. Bioactive peptide synthesis from honey protein and its biochemical characterization (CSIR, Rs.0.00 Lakhs)
13. Biodepolymerization of low grade lignite to Biomethane and Humic acid (ONGC, New Delhi, Rs.248.00 Lakhs)
14. Characterization of soil reflectance in the visible and near-infrared region for the iron-rich soils of eastern India (SERC, DST, New Delhi, Rs.19.65 Lakhs)
15. Climate change and rice-based crop production system of eastern and south eastern India: Impact assessment and risk management through simulation (C-MMACS, CSIR, Bangalore, Rs.16.67 Lakhs)
16. Designing optimum size of rainwater harvesting and recycling structure for diversified cropping system in rainfed upland ecosystems in rainfed upland (CSIR, Rs.17.76 Lakhs)
17. Development of a GIS based decision support system for irrigation system management (INCID, New Delhi, Rs.42.48 Lakhs)
18. Development of a GIS based decision support system for irrigation system management (Indian National Committee on Surface Water (INCSW), Ministry of Water Resources (MoWR), Rs.42.47 Lakhs)
19. Development of a Prototype for Continuous Production of Kheer (NDDB, Anand, Rs.6.25 Lakhs)
20. Development of Agricultural Machines (NIFP) (National Innovation Foundation, Ahmedabad, Rs.5.73 Lakhs)
21. Development of an automatic vegetable transplanter with technology for paper pot seedlings (Council of Scientific and Industrial Research, Rs.12.94 Lakhs)
22. Development of cage for mariculture through numerical & physical modeling (MOES, New Delhi, Rs.47.00 Lakhs)
23. Development of criteria and indications for sustainable forest management in Sunderbans mangrove forest under joint forest management ((CSIR, New Delhi), Rs.3.00 Lakhs)
24. Development of e-Courses for B.Tech. (Agricultural Engineering) (ICAR-NAIP (New Delhi), Rs.78.11 Lakhs)
25. Development of e-Courses for B.Tech. (Agricultural Engineering) (NAIP, ICAR, New Delhi, Rs.78.11 Lakhs)
26. Development of GIS based decision support system for irrigation system management (INCID, Min. of Water Recourses, Govt. of India, Rs.42.47 Lakhs)
27. Development of Technology and Prototype Facility for Enhancement of Shelf life of Fruits and vegetables through Active Packaging and Modified Storage (Department of Biotechnology, Govt of India, Rs.89.00 Lakhs)
28. Development of Technology for processing and preservation of ripe Palmyra Palm fruits (ICAR, Rs.23.00 Lakhs)
29. Development of Vermicompost Technology and Organic Farming at DTRDC, Kurseong, Darjeeling and at IIT Kharagpur (DTRDC, Tea Board, Govt. of India, Darjeeling, Rs.9.00 Lakhs)
30. Distributed Hydrological Modelling to Analyse Sediment and Nutrient Status of Brahmanibaitaran Delta (Space Applications Centre, Ahmedabad, Rs.10.46 Lakhs)
31. Elucidating fragrant methoxybenzaldehyde biosynthesis in hairy roots/normal root cultures of Hemidesmus indicus (completed in April-2012) (DAE-BRNS, Mumbai, Rs.25.00 Lakhs)
32. Enhancing Research Capacity and Initiating Integrated M Tech & Ph D programme in Food Science & Technology (Department of Biotechnology, Government of India, New Delhi, Rs.837.80 Lakhs)
33. Ensemble modeling of rainfall-runoff transformation process (INCOH, New Delhi, Rs.26.43 Lakhs)
34. Ensemble modeling of rainfall-runoff transformation process (Indian National Committee on Surface Water (INCSW), Ministry of Water Resources (MoWR), Rs.26.44 Lakhs)
<table>
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<tr>
<th></th>
<th>Project Description</th>
<th>Funding Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>Flood inundation zoning for different return periods in Mahanadi river basin (Indian National Committee on Surface Water (INCSW), Ministry of Water Resources (MoWR))</td>
<td>Rs.36.00 Lakhs</td>
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<tr>
<td>36</td>
<td>Forecasting Agricultural output using Space, Agrometeorology and Land based Observations (Ministry of Earth Sciences, Rs.12.00 Lakhs)</td>
<td></td>
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<tr>
<td>37</td>
<td>Formulation and Pilot Scale Unit for Production of Therapeutic Food in Reafy-to-Eat Form (TF-RTE) for Management of SAM Children (Department of Biotechnology, Govt of India and M/s GCPL New Delhi)</td>
<td>Rs.218.70 Lakhs</td>
</tr>
<tr>
<td>38</td>
<td>Groundwater modelling in selected basins between Farakka and Ganga Sagar (Ministry of Environment &amp; Forest, Government of India, Rs.25.00 Lakhs)</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>HighNoon: Adaptation to changing water resources availability in northern India with Himalayan glacier retreat and changing monsoon pattern (European Commission, Rs.155.00 Lakhs)</td>
<td></td>
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<tr>
<td>40</td>
<td>Hydrological Modelling of Watersheds to Evaluate Impacts of Watershed Structures on Surface Flow and Groundwater Recharge (Department of Science &amp; Technology, New Delhi, Rs.19.33 Lakhs)</td>
<td></td>
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<tr>
<td>41</td>
<td>Impact of MGNREGA in one District of West Bengal and Mandal, M.P. (MoRD, Rs.20.00 Lakhs)</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Implementation of Agro-techniques towards recovery of lost soil fertility to salinity after Aila incidence in Dayapur, island of Sunderban areas: An i (NABARD, Kolkata, Rs.9.00 Lakhs)</td>
<td></td>
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<tr>
<td>43</td>
<td>Indo-Denmark Collaborative research project on High rate algal biomass for food, feed and bioenergy (DBT, GOI, Rs.0.00 Lakhs)</td>
<td></td>
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<td>44</td>
<td>Integrated Agromet Advisory Services (Ministry of Earth Sciences, Government of India, Rs.30.00 Lakhs)</td>
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<td>45</td>
<td>Integration of rainwater harvesting and climate resilient agriculture in sustaining productivity and profitability of rainfed agro-climatic zones o (ICAR, Rs.111.00 Lakhs)</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Integration of rainwater harvesting and climate resilient agriculture in sustaining productivity and profitability of rainfed agro-climatic zones of e (CRIDA (ICAR), Rs.111.00 Lakhs)</td>
<td></td>
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<tr>
<td>47</td>
<td>Interdisciplinary network for holistic environment system analysis, eco-system services, integrated modelling and sustainable resources management (IN (BMBF, Germany, Rs.85.00 Lakhs)</td>
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<td>48</td>
<td>Kheer Making (NDDB, Rs.6.25 Lakhs)</td>
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<tr>
<td>49</td>
<td>Land use and cover dynamics in relation to human dimension and climate in Mahanadi river basin, Orissa (NRSC, Hyderabad, Rs.22.80 Lakhs)</td>
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<tr>
<td>50</td>
<td>Modeling the performance of a few major cropping systems in eastern India in the light of projected climate change (National Agricultural Innovation Project, ICAR, New Delhi, Rs.50.00 Lakhs)</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>NAIP project entitled “Precision Farming Technologies in Production Agriculture” (ICAR, New Delhi, Rs.59.74 Lakhs)</td>
<td></td>
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<tr>
<td>52</td>
<td>Operational Research Project on Agro-processing centre (ICAR, New Delhi, Rs.5.54 Lakhs)</td>
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<td>53</td>
<td>Perturbing phenolic natural product metabolism in tobacco by expressing a cryptogein gene of novel elicitor function (DST-SERB, New Delhi, Rs.34.50 Lakhs)</td>
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<tr>
<td>54</td>
<td>Power generation with reduced emissions using de-oiled cake and biodiesel from non-edible oil seeds (Department of Science &amp; Technology, Rs.33.07 Lakhs)</td>
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<tr>
<td>55</td>
<td>Precision Farming Development Centre (National Committee on Plasticulture Application in Horticulture, Government of India, Rs.250.00 Lakhs)</td>
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<tr>
<td>56</td>
<td>Precision Farming Technologies based on Microprocessor &amp; Decision Support Systems for Enhancing Input Application Efficiency in Production Agriculture (ICAR, NAIP, Rs.46.49 Lakhs)</td>
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<td>57</td>
<td>Production and performance evaluation of of biodiesel production from tree based oils (with high free fatty acids) and their mixtures (Petroleum Conservation Research Association, Rs.11.62 Lakhs)</td>
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<tr>
<td>58</td>
<td>Production of Citrus Juice through enzymatic debittering (DBT, Rs.0.00 Lakhs)</td>
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<td>59</td>
<td>Production of ethanol from lignocellulosics: Lab to Pilot scale (DBT, Rs.345.00 Lakhs)</td>
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<tr>
<td>60</td>
<td>Rapid soil carbon mapping using soil reflectance in the visible and near-infrared region (NRDMS, DST, New Delhi, Rs.60.00 Lakhs)</td>
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<tr>
<td>61</td>
<td>Research and Development &amp; Dissemination of Human Energy or Minimal Energy Driven Composite Devices for Farm Level Processing of Agricultural Products (Department of Agriculture, MW&amp;C Branch, Government of West Bengal, Rs.43.00 Lakhs)</td>
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<tr>
<td>62</td>
<td>Rural Technology Action Group-EI (PSA, GOI, Rs.90.00 Lakhs)</td>
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</table>
63. Standardization of process parameters in withering, maceration, rolling, fermentation and drying of tea (SOP) (Tea Board, Government of India, Kolkata, Rs.0.00 Lakhs)
64. Studies on Cryogenic Grinding for Retention of Flavour and Medicinal Properties of Some Important Indian Spices. (NAIP, ICAR (WORLD BANK FUNDED PROJECT), Rs.90.10 Lakhs)
65. Studies on High Pressure Processing (HPP) of High Value Perishable Commodities (National Agricultural Innovation Project, ICAR, New Delhi, Rs.340.69 Lakhs)
66. Studies on Microalgal Triacylglycerols (TAGs) as a Source of Biodiesel (ICAR, New Delhi, Rs.170.29 Lakhs)
67. Study of heat and mass transfer and estimation of CO2 mitigation during solar drying of food products (ISIRD, SRIC, Rs.4.87 Lakhs)
68. Survey to Identify the Practices for Ripening of Fruits (ICAR-ICMR, Rs.0.00 Lakhs)
69. Understanding scent volatiles emission in Polianthes tuberosa flowers (CSIR, New Delhi, Rs.25.00 Lakhs)
70. Upgradation of laboratory and library facilities for renewable energy programme (MNRE, Rs.50.00 Lakhs)

Consultancy Projects

1. 4. Rainwater Harvesting at Bokaro Steel Ltd. (Bokaro Steel Ltd., SAIL, Rs.7.50 Lakhs)
2. Agriculture Farming System and Management (HMV Laboratory, Panskura, Rs.3.50 Lakhs)
3. Construction of periphery road in the BRBNMPL campus (Bharatiya Reserve Bank Note Mudran Ltd., Salboni, Rs.10.00 Lakhs)
4. Educational and Design Software (State and Central Govt Agencies, Rs.0.00 Lakhs)
5. Evaluation of Antioxidant Potential, Synergestic Behaviour and Stability of Rosemary & Sage Extracts (M/s Synthite Industries Ltd., Kolenchery, Kerala, Rs.49.90 Lakhs)
6. Evaluation of capacity of Rice Mill at Midnapur (Rice Millers’ Association, Rs.0.00 Lakhs)
7. Evaluation of Probable Maximum Flood for Nagarjun Sagar Dam (Irrigation and CAD Department, Govt. of Andhra Pradesh, Rs.29.00 Lakhs)
8. Groundwater Exploration at Bengal College of Engineering and Technology Campus, Durgapur (Director (Admn.), Bengal College of Engineering and Technology, Rs.0.73 Lakhs)
9. Intervention Analysis of the IGB Basin Focal Project (International Water Management Institute, Sri Lanka, Rs.6.00 Lakhs)
10. Performance Evaluation of power weeder and vertical conveyor reaper (Bengal Tools Ltd., Rs.0.52 Lakhs)
11. Performance of a bia-ply tyre (PBPT) (TVS Tyres Ltd, Madurai, Rs.5.52 Lakhs)
12. Planning and Design of Rainwater Harvesting Systems for Cement Grinding Unit in Purulia (West Bengal) (Reliance Cement Company Pvt. Ltd. Mumbai, Rs.4.91 Lakhs)
13. Preservation of fresh betel leaves cultivated in and around Midnapore District (Private party (Sri Krishna Cold Storage, Nonakuri Bazaar, East Midnapore, WB), Rs.0.22 Lakhs)
14. Probable maximum flood estimation for Nagarjunasagar Dam (SE, N.S. Dam Circle, Govt. of Andhra Pradesh, Rs.29.10 Lakhs)
15. Rainwater Harvesting at Arati Steel Ltd. (Arati Steel Ltd., Cuttack, Rs.4.20 Lakhs)
16. Rainwater Harvesting in the UAL Bengal Campus (UAL Bengal, Rs.2.00 Lakhs)
17. Study of effect of mining activities on water quality in surrounding areas (Tata Steel, Noamundi, Rs.15.00 Lakhs)
18. Tea Based Crop Planning (TBCP) (Greenfeel Services Ltd, Kolkata, Rs.1.00 Lakhs)
19. Testing of Angad Power Weeder and Reversible Mould Board Plough (M/s SAS Motors Limited, Rs.0.74 Lakhs)
20. Testing of Rice Mills (TTRM) (B K Agro Products Pvt Ltd, Rs.0.10 Lakhs)
21. Testing of Texas Tiller (TGTT) (M/s Texas Farm & Garden Technologies Pvt. Ltd., Gurgaon, Haryana, Rs.1.55 Lakhs)
22. TPIA for Creation of Teaching Labs for NIFTEM (Ministry of Food Processing Industries, Govt of India, Rs.13.80 Lakhs)
23. Tractive performance of bias-ply and radial-ply tyres (Apollo Tyres Ltd, Vadodara, Rs.19.85 Lakhs)
24. Vermicomposting (Greenfield Agrotech, Rs.0.25 Lakhs)

**Technology Transferred**

1. Rotary Club, Kolkata - Domestic Filter for Arsenci Free Drinking Water : Rs. 0.00 Lakh
2. Datan Manab Kalyan Kendra, Datan - Doop- Stick Making Machine, Modified Sabai Grass Rope Making Machine : Rs. 0.00 Lakh
3. Keshiary - Integrated Puffed Rice Making Machine : Rs. 0.00 Lakh
4. Suchetana, Jhargram - Leg Driven Amber Charkha, Modified Sabai Grass Rope Making Machine : Rs. 0.00 Lakh
5. Loddhasuli - Leg Driven Potters Wheel : Rs. 0.00 Lakh
6. Bamunmara - Puffed Rice Making Machine, Leg Driven Potter Wheel : Rs. 0.00 Lakh
7. Gharisole - Sabai Grass Machine, Puffed Rice Making Machine : Rs. 0.00 Lakh
8. Nayagram - Sabai Grass Rope Making Machine, Puffed Rice Making Machine : Rs. 0.00 Lakh
9. 70 Beneficiaries - Small scale manually operated oil expeller : Rs. 0.20 Lakh
10. 70 Beneficiaries - Small scale manually operated pulse mill : Rs. 0.20 Lakh
11. 4 Beneficiaries - Small scale manually operated tuber starch extractor : Rs. 0.20 Lakh
12. 70 Beneficiaries - Small scale manually operated/motor operated spice grinder : Rs. 0.20 Lakh
13. Farmers of Jhilimili, Panagarh, Mallarpur, and Puncha in West Bengal - Transfer of OFR Technology to villages with the cooperation of Purbanchal Kalyan Ashram, an NGO : Rs. 0.00 Lakh

**Patents (filed / granted)**

1. A method for enzymatic delignification of lignocellulosic raw materials
2. A process for increasing shelf-life of sugar cane juice
3. A process for preparation of gallic acid by co-culture
4. A process on lactic acid production from starchy agro-residues
5. A process technology for production of soluble black tea
6. A system for extraction of essential oil from plants/parts thereof bearing essential oil
7. Aloe Vera Gel Filleting Machine and a Method for Filleting
8. An edible film from Soy Whey and a process for the Preparation.
9. An Improved Pedal Driven Potters Wheel Machine
10. Bamboo Sliver Making Machine
11. Barley-Flaxseed mix soup
12. Biodepolymerization of humic acid from lignite
13. Chironji nut decorticator
14. Conical Roller Jamun Juice Extractor
15. ENZYMATIC PEELING OF POTATOES
16. Enzymatic saccharification and fermentation of pretreated lignocellulosic raw material
17. Flow-regulated Drip Emitter
18. Kick Driven Potters Wheel
19. Leg operated Jute Rope Making Machine
20. Leg-driven Amber Charkha
21. Modified Sabai Grass Rope Making Machine
22. Motorized Jute Rope Making Machine
23. Process for preparation of Gluten free bread
24. Process Technology for Instant (Soluble) Tea Manufacture
25. Process Technology for Mango-Milk Based Fruit Bar
27. Purification of lactic acid and its polymerisation to Polylactic acid (PLA) with improved property.
28. Sabai Grass Rope Polishing Machine
29. Single screw extruder for third generation snacks
30. Sun Tracking Solar Dryer
31. Sweat Irrigation System
32. Tamarind De-Seeder Machine

Visits Abroad by Faculty Members

1. Srinivasa Rao, Pavuluri - Attended ASABE Annual Meeting (Dallas, Texas, USA, ) 28 July to 1 August 2012
2. Panda, Rabindra Kumar - To make an oral presentation in International CIPA conference (Tel Aviv, Israel, ) May 15-17, 2012
3. Mishra, Ashok - Project scoping workshop (Dhaka, Bangladesh, ) 16-22 September, 2012
4. Mishra, Hari Niwas - To deliver Invited Lecture (University College, Dublin, ) April 2012
5. Mishra, Hari Niwas - To attend International Conference (MMU, Manchester, UK, ) April, 2012
6. Goswami, Tridib Kumar - To present paper (Dallas, USA, ) 28th July 1st August, 2012
7. Das, Bhabani Sankar - Attend Conference (Germany and Chezch Republic, ) 10 days
8. Mitra, Adinpunya - Paper presentation in International conference (Chiang-Mai, THAILAND, ) October-2012 (4 days)
10. Mitra, Adinpunya - Research stay (University of Rostock, GERMANY, ) June-2012 (4 weeks)
11. Chatterjee, Chandranath - To participate in a workshop to develop a collaborative project to be funded by BMBF and DST (Potsdam University, Germany, ) 1 week (2 September, 2012 to 9 September, 2012)
12. Swain, Dillip Kumar - Invited Lecture (Bangkok, Thailand, ) 19 to 22 November 2012
14. Mishra, Hari Niwas - Member of CII Delegation to USA on Food Processing and Agriculture (Washington DC, Maryland, Sanfransisco and Berkeley, USA, ) November 2012
15. Datta, Ashis Kumar - To attend V International Symposium on Advances in computational Heat Transfer (University of Bath, UK, ) July 1- 6, UK
16. Banerjee, Rintu - International collaboration (UC Berkeley, ) July 8th- 16th July
17. Banerjee, Rintu - To receive award (Taiwan, Taipei, ) 6th-9th Oct2012
18. Banerjee, Rintu - International Collaboration (Germany, ) 22nd Oct-29th Oct12

Invited Lectures by Faculty Members

1. Water Management of Horticultural Crops by Tiwari, Kamlesh Narayan (NBSS & LUP, Salt Lake City Kolkata)
2. Challenges ahead in land and water resources and their solutions through research and development by Tiwari, Kamlesh Narayan (IARI New Delhi)
4. Status of Agricultural Mechanization in State of West Bengal India by Tewari, Virendra Kumar (Dhaka, Bangladesh)
5. Phenolic fragrance from Hemidesmus indicus roots - biosynthetic and in vitro pharmaceutical studies by Mitra, Adinpunya (University of Rostock)
6. Potential of rainwater harvesting in IIT Gandhinagar campus by Panda, Sudhindra Nath (IIT Gandhinagar)
7. Undergroundwater and its Use by Panda, Sudhindra Nath (Sutahata Janakalyan Sikshaniketan, Sutahata)
8. Managing water resources for sustainable natural resources by Panda, Sudhindra Nath (IIT Kharagpur)
9. Biochemical insight of floral fragrance emission - A new by Mitra, Adinpunya (National Research Centre for Orchids, Sikkim)
10. Simulation modelling for sizing lined on-farm pond for various crop substitution ratios ... by Panda, Sudhindra Nath (Tel Aviv, Israel)
11. Use of crop model for rice production management by Swain, Dillip Kumar (AIT, Bangkok, Thailand)
13. Bioactive Ingredients: Functionality and Stability During Processing & Storage by Mishra, Hari Niwas (MMU, Manchester, UK)
14. Trends in Food Science & Technology Research and Education by Mishra, Hari Niwas (UCD, Dublin, Ireland)
15. Novel Technologies for Food Processing & Packaging by Mishra, Hari Niwas (BARC, Mumbai)
17. Post Harvest Processing and Management of Fruits and Vegetables by Mishra, Hari Niwas (UC Davis, California, USA)
18. Food Laws: Food quality and Safety standards by Guha, Proshanta (IIT, Kharagpur (Food safety & Quality management Professional Course))
19. Antioxidant activity: An overview by Das, Madhusweta (Gurunanak Institute of Technology, Kolkata)
20. Application high pressure for perishable fruits by Srinivasa Rao, Pavuluri (Central Institute of Fisheries Technology, Cochin)
21. Design of MA packaging system for fruits by Goswami, Tridib Kumar (Kottayam, Kerala)
22. Food Safety and quality by Goswami, Tridib Kumar (Dept. of Chemical Tech, North Maharashtra University, Jalgaon (M.S.), India)
23. Challenges and Opportunities in Food Production and Safety by Goswami, Tridib Kumar (Hotel Mayfair, Bhubaneswar)
24. Food Packaging by Goswami, Tridib Kumar (ICFoST XXII, CFTRI, Mysore)
25. Cryogenics in Food Processing and preservation by Goswami, Tridib Kumar (NIFTEM, Haryana)

**Books Published**


**Short-Term Courses, Training Programmes and Workshops organised**

2. Engineering & Management in fisheries & Aquaculture (23 -30 June 2011)
3. Hyperspectral remote sensing and applications in water resources (6 days)
4. IIT-CII FACE Certified Food Professional Course on Food Safety and Quality Management (FSQM-2013) (February 18- March 8, 2013)
6. Plasticulture applications in Horticultural Crops (July 16-17, 2012)
7. Plasticulture Applications in Horticultural Crops (December 20-21, 2012)
8. Precision Farming in Horticulture (March 14-15, 2013)
10. Protected Cultivation Technologies (January 17-18, 2013)
11. Protected Cultivation Technologies (June 11-12, 2012)
12. Scope of Greenhouse and Plasticulture in Horticulture (October 08-09, 2012)
Papers Published in Journals


16. Copolymerization of lactic acid for cost-effective PLA synthesis and studies on its improved characteristics By Bishai, M, De, S, Adhikari, B., Banerjee, R. Food Science and Biotechnology 22(1), 73-77. (2013)


25. Effect of high pressure processing on physical, biochemical and microbiological characteristics of black tiger shrimp (Penaeus monodon). By Barjinder Pal Kaur, Kaushik, N., P. Srinivasa Rao and O.P. Chauhan *Food and Bioprocess Technology* DOI 10.1007/s11947-0 (2012)
27. Effect of pH and distance between electrodes on the performance of sediment microbial fuel cell. By Sajana, T.K, Ghangrekar, M.M and Mitra, A *Water Science and Technology* Accepted for publication (0)
29. Effect of symbiotic interaction of fructooligosaccharide and probiotics on the acidification profile, textural and rheological characteristics of fermented soy milk. By Mishra S and Mishra H N *Food and Bioprocess Technology* (2012)
41. Farm Mechanization Status of West Bengal in India. By V.K. Tewari, A. Ashok Kumar, Satya Prakash Kumar and Brajesh Nare Basic Research Journal of Agricultural Science and Review 1(6), 139-146 (2012)
42. Fermentation of vegetable juice mixture by probiotic lactic acid bacteria. By Sharma V and Mishra H N Nutrafoods Accepted, In Press (2012)
46. Growth characteristics modeling of Bifidobacterium bifidum using RSM and ANN. By GS, Gupta S, Majumdar GC and Banerjee R Brazilian Archives of Biology and Technology, 51, 53:5, 482-496. (2012)


68. Moisture sorption isotherm and isosteric heat of sorption of edible films made from blends of starch, amylose and methyl cellulose By Tanima Chowdhury, and Madhusweta Das International Food Research Journal 19, 1669-1678 (2012)


73. Optimization of lipid enriched biomass using oleaginous fungus by RSM By S. P. Jeevan Kumar, Banerjee R Indian Jl of Experimental Biology in press (2013)


85. Rapid separation of carotenes and evaluation of antioxidant capacity from ripened fruit waste of Areca catechu, a plantation crop of agro-industrial importance By Mahesh Kumar, Utkarsh Moon and Adinpunya Mitra *Industrial Crops and Products* 40: 204-209 (2012)


92. Sub-basin scale characterization of climate change vulnerability, impacts and adaptation in an Indian River basin By Bhave, A.G., A. Mishra, A. Groot *Regional Environmental Change* DOI 10.1007/s10113-0 (2013)


Papers Presented in Conferences


45. Modified Atmosphere Packaging of Apple (cv. Royal Delicious), Guava (cv. Baruipur) and Litchi (cv. Shahi), By Goswami, T.K. and Mangaraj, S., Present at the American Society of Agricultural and Biological Engineers (ASABE) annual meeting, Dallas, USA, (2012)


47. Novel Technologies in Precision Agriculture, By Tewari, V.K., Ashok Kumar, A., Kumar, S.P., Brajesh Nare, National Seminar on Small Farm Mechanization, NRFMTTI, Hisar (Haryana), (2012)


49. Photooxidative stress in hairy roots of Daucus carota upon continuous illumination is ameliorated by enhanced BADH and SOD activities, By Chiranjit Mukherjee, Adinpunya Mitra, International Conference on Bioresource and Stress Management, Science City, Kolkata, (2013)


55. Production of bioethanol from potato waste, By Chintagunta AD and Banerjee R,, International Symposium on New Horizons in Bioenergy Research,, at IIT Kharagpur, India,, (2013)
56. Production of biomethane from pineapple waste, By Kumar M, Jacob SB and Banerjee R,, International Symposium on New Horizons in Bioenergy Research,, at IIT Kharagpur, India,, (2013)
57. Regulation of bioactive xanthone biosynthesis in Hoppea fastigiata, By Utkarsh Moon, Adinpunya Mitra, 5th International Conference on Medicinal Plants and Herbal Products, Manipal University, Manipal, (2013)
64. Testing CERES-rice model for elevated CO2 environment using open top chamber experiment, By Sushree Sagarika Satapathy and Dillip Kumar Swain, International Symposium on sustainable rice production and livelihood security: Challenges & Opportunities, CRRI, Cuttack, (2013)
66. Tyrosinase and acetylcholinesterase inhibitory activities of fragrant methoxybenzaldehydes from Hemidesmus indicus roots and Vanilla planifolia pods, By Anish Kundu, Adinpunya Mitra, 5th International Conference on Medicinal Plants and Herbal Products, Manipal University, Manipal, (2013)
67. Use of aquarium for releasing stress and holistic mental growth in children, By Arunabha Mitra, 100th Indian Science Congress, Kolkata, (2013)
69. Whippability and rheological characteristics of dairy cream as influenced by Xanthan / Locust bean Gum incorporation,, By Chitra J, Deswal A, Deora N S and H N Mishra, International Conference on Food Safety, Quality & Nutrition: Greening the Food Industry,, Manchester, UK,, (2012)
Department of Architecture & Regional Planning

**Head**
Prof. Jaydip Barman

**Professors**
Banerjee, Uttam Kumar  
*Ph.D. (IIT Kharagpur)*, Urban Design, Green Buildings and Eco Habitat, Tourism Planning and Management, Urban Waterfront Development, Landscape Design in Defensible Space

Barman, Jaydip  
*Ph.D. (IIT Kharagpur)*, Urban Design, Green Buildings and Eco Habitat, Tourism Planning and Management, Urban Waterfront Development, Landscape Design in Defensible Space

Chattopadhyay, Subrata  
*Ph.D. (IIT Kharagpur)*, Company housing Peri urban dynamics Slum upgrading Effect of transit on housing location choice

Datta, Rabindranath  
*Ph.D. (IIT Kharagpur)*, City Planning Urban and Regional Transportation Planning

Sen Gupta, Biplab Kanti  
*MCP (IIT Kharagpur)*, Urban and Regional Planning, Architecture and Urban Design, Development Management and Finance

**Associate Professors**
Basu, Sanghamitra  

George, Abraham  
*Ph.D. (Calicut University)*, Architecture Design-Pedagogy-Graphics-Sustainable Designs-Landscape-Housing-Preservation

Sen, Joy  
*Ph.D. (IIT Kharagpur)*, Community and Regional Planning & Programming, Architecture and Planning related Heritage Studies & Documentation

Sen, Somnath  
*Ph.D. (IIT Kharagpur)*, Environmental Planning and Landuse Planning

**Assistant Professors**
Banerji, Haimanti  

Bhattacharya, Shankha Pratim  
*Ph.D. (BIT, Mesra)*, Earthquake Resistant Building, Structural Systems, Building Physics

Chakraborty, Banhi  
*Ph.D (IIT Kharagpur)*, Consumer Welfare, Rural Economics, Rural and Forest Livelihood

Das, Sutapa  
*Ph.D. (National University of Singapore)*, Building maintainability, Building performance grading, Decision making, Construction materials, Project management, Intelligent building, Safety management

Majumdar, Tapan Kumar  
*MCP (IIT Kharagpur)*, Work environment in industries for industrial workers, Low cost Construction

Mazumder, Tarak Nath  
*Ph.D (IIT Kharagpur)*, Urban Planning, Transportation Planning, Hazardous Waste Management

Pandit, Deapratim  
*Ph.D. (Univ. of Tokyo)*, Transportation Planning, Urban Services & Utilities, Urban Environmental Planning, GIS & RS
Paul, Saikat Kumar  

**Faculty Re-employment**

Prof. Rabindranath Datta  
Professor

**New Academic Programmes**

M. Arch: Master of Architecture in Sustainable Built Environment is under consideration.

**Brief Description of on-going activities**


Art and Architecture: (Indian Traditional Architecture and Heritage studies, Vernacular Architecture, Design, Visual Communication, Visual Simulation, Product design and Industrial design)

Infrastructure and spatial Planning: (Transportation Planning, Traffic Engineering and Management, Hazards and Disaster Mitigation and Management, Urban Design, Eco-tourism, Recreation and Landscape Planning, Conservation and Preservation Studies, Housing and Shelter, Social Infrastructure)


Architecture, Media and Communication: (Cultural studies, Media and Architectural journalism, Symbolism and Cultural sustainability)

**Thrust Areas**

2. Urban information system
3. Universal Design in Built Environment

**New Acquisitions**

1. Digital cum computerized Universal Testing Machine model MUTC- 60 Capacity 600KL

**Lectures by Visiting Experts**

1. Contemporary Architecture of Fernando Menis by Ar. Ferando Menis and Associates (Visiting Expert from Spain)
2. Modern Lighting concepts and LED applications in Interior Design and Urban Design. by Ms. Sudesha Mukhopadhyay (Director, Philips Lighting Education Program)
3. Clay Modelling, Pottery and Ceramics by Mr. Somnath Raha and group (Artist, Delhi Art College)
4. Approaches towards Transit Oriented Development (TOD) in current transportation planning. by Prof. S.L. Dhingra (Professor Emeritus, Civil Engineering,IIT Bombay)
Doctoral and MS Degrees Awarded

1. Keya Chakravarty : A Methodology to Assess inequality Variation within Kolkata Urban Agglomeration Applying Human Development Index based Indicators (PhD)
2. Lakshmi Thilagam : Comparative Analysis of Spatial Configuration of Historical Temple Towns of Tamil Nadu applying Space Syntax and Urban Image Analysis(PhD)
3. Paul Varghese : Shape Algebra and Rules in Design: Bridging the Gap between Formal and Intuitive Thinking (PhD)

Member - Professional Bodies

1. Chakraborty, Banhi, Associate member - Institute of Town Planners India

Awards & Honours

1. Paul, Saikat Kumar (2013) Fulbright Fellowship Awarded for research at Cornell University

Sponsored Research Projects

1. Creation of a Universally Stimulating and Responsive Environment within Hospitals - A Conceptual Research Model (SRIC, Rs.4.70 Lakhs)
2. Developing Suitable Pedagogical Methods for various classes, intellectual calibers and learning, Course: Structural System (National Mission on Education through Information and Communication Technology (NMEICT) of MHRD, Gov. Rs.5.00 Lakhs)
3. Development of a Methodology for Bus Transit Reform and Redesign: Case study Kolkata (ISIRD, SRIC, IIT Kharagpur, Rs.2.80 Lakhs)
4. Development of Women Technology Park in Nayagram Tribal Block, West Midnapore, West Bengal (Department of Science and Technology, Govt. of India, Rs.24.71 Lakhs)
5. Rural Industrialisation in West Bengal: Technology Intervention & Management of Development (TMD) (Khadi and Village Industries Commission, Govt. of India, Rs.60.00 Lakhs)
6. Sustainable Urban planning in India (to be released in summer 2013) (The Energy Research Institute (TERI) New Delhi, Rs.0.60 Lakhs)
7. Swami Vivekananda - A Forerunner of Universal renaissance: Vision 2100 - work completed under the sponsorship of Ministry of Culture Govt of India (The Indological Research Cell (IRC), The R K M Institute of Culture, Kolkata, Rs.0.50 Lakhs)
8. Technology Dissemination Program of IIT Kharagpur Interface of KVC programme (Khadi and Village Industries Commission, Govt. of India, Rs.12.00 Lakhs)
9. Women Technology Park at Nayagram Tribal Block,Paschim Medinipur,West Bengal (Science & Society Division, Deptt. of Science & Technology, Govt. of India, Rs.46.00 Lakhs)

Consultancy Projects

1. Architectural Consultancy services for proposed 9500 sq ft residential block in Ghatal municipality, Midnapore (Residents of Ghatal Municipality, Rs.2.85 Lakhs)
2. Comprehensive Development Plan for Bhubaneswar and Cuttack (Ministry of housing and urban development, govt. of Orissa, Rs.165.29 Lakhs)
3. Development plan preparation for Korba urban area, Chhattisgarh (Directorate of Town and Country Planning, Chhattisgarh, Rs.29.92 Lakhs)
4. Development Strategies for Coochbehar District (NREG, Coochbehar, Rs.10.00 Lakhs)
5. Land Use and Development Control Plan, Asansol Sub-Division (ADDA, Rs.40.00 Lakhs)
6. Land Use Development Plan for Haldia (Haldia Development Authority, Purba Medinipur, Rs.70.00 Lakhs)
7. MAKING OF A SURVEY ON SUSTAINABILITY OF TOURISM INDUSTRY IN KERALA/THRISSUR (Department of Tourism Science, Tokyo, Rs.3.74 Lakhs)
8. Monitoring landuse changes at Barrackpore Cantonment (Barrackpore Cantonment Board, Rs.8.50 Lakhs)
9. Perspective Plan for for MKDA region (Medinipur Kharagpur Development Authority(MKDA), Rs.18.08 Lakhs)
10. Perspective plan for MKDA (Midnapore Kharagpur Development Authority, Paschim Midnapore, Rs.0.00 Lakhs)
11. PRELIMINARY MASTER PLAN FOR CSIR INNOVATION COMPLEX AT BARUIPUR (CSIR, Rs.533710.00 Lakhs)
12. PREPARATION OF AIZAWI MASTER PLAN (Aizawl Development Authority, Rs.702500.00 Lakhs)
13. Preparation of Aizawl Master Plan (Aizawl Development Authority, Rs.70.22 Lakhs)
14. Preparation of Concept Plan for St Xaviers College in New Town rajarhat (St Xaviers College and Basumati Enterprise Kolkata, Rs.2.50 Lakhs)
15. Preparation of Land Use and Development Control Plan for Haldia (RLDC) (HDA, Rs.5515000.00 Lakhs)
16. Preparation of Perspective Plan- Vision 2030 and Comprehensive Development Plans for Planning Areas of Bhubaneswar & Cuttack Development Authority (Housing and Urban Development, Government of Orissa, Rs.165.29 Lakhs)
17. Preparation of Temple Plan in Midnapore (Loknath Temple Trust Midnapore, Rs.1.00 Lakhs)
18. Preparation of Zonal Development Plan for 14 Planning Zones of Bhubaneswar Development Area (BDA, Rs.400.00 Lakhs)
19. Preparation of zonal development plan for 14 planning zones in Bhubaneswar Development Plan Area (Bhubaneswar Development Authority, govt. of Orissa, Rs.391.00 Lakhs)
20. PREPARATION OF ZONAL DEVELOPMENT PLANS FOR 14 PLANNING ZONES OF BHUBANESWAR DEVELOPMENT PLAN AREA (Bhubaneswar Development Authority, Rs.39163000.00 Lakhs)
21. Preparation of Zonal Development Plans for 14 Planning Zones of Bhubaneswar Development Plan Area (BDA, Rs.391.60 Lakhs)
22. Preparation of Zonal Development Plans for 14 Planning Zones of Bhubaneswar Development Plan Area (PZDP) (Bhubaneswar Development Authority, Rs.391.63 Lakhs)
23. REVISION/AMENDMENT OF THE LANDUSE AND DEVELOPMENT CONTROL PLAN FOR OLD HALDIA PLANNING AREA (Haldia Development Authority, Rs.5515000.00 Lakhs)
24. STEP BUILDING AT GOPALI (STEP IIT Kharagpur, Rs.600000.00 Lakhs)

Visits Abroad by Faculty Members

1. Sen, Joy - Plenary talk: Graduate School of Urban environmental Services Tokyo Metropolitan University Japan (Tokyo Japan, ) November 2 2012
3. Das, Sutapa - Paper presentation in int. conference (Penang, Malaysia, ) 4 days
4. Paul, Saikat Kumar - Research and Teaching (Cornell University, ) 4 months starting 15th March 2013

Invited Lectures by Faculty Members

1. Sustainable Urban Development by Paul, Saikat Kumar (Raipur, Chattisgarh)
2. Architecture of Civilization 2012 by Sen, Joy (UNESCO sponsored IUHU Course at Institute of Culture (RMIC))
3. Indian Civilization - This time the Center is India - Shovabazar Rajbari 2013 by Sen, Joy (Special lecture on Civilization of India organized by Sarada Math Rasik Bhita in February 2012)
4. An approach to assess composite levels of Livability-affordability: case study of Kolkata UA by Sen, Joy (Tokyo Metropolitan University Japan Nov 2012)
5. Challenges in Transport Planning and Management in India by Datta, Rabindranath (SPA Bhopal)
6. Water management to Water Sensitive Design- by Sen, Somnath (CSE, New Delhi)
7. Advanced Rainwater Harvesting by Sen, Somnath (CSE, New Delhi)
8. Creating Expressionistic Spaces in Architectural Design by Barman, Jaydip (Department of Architecture, National Institute of Technology Patna)
9. Sustainable Architecture by George, Abraham (Sardar Vallabhbhai National Institute of Technology)
11. Inclusive Urban Development by Sen Gupta, Biplab Kanti (SPA Bhopal)
12. Social Infrastructure Development by Sen Gupta, Biplab Kanti (BIT Mesra)
13. Planning for a Beautiful City – Development Control for Urban Beautification by Basu, Sanghamitra (Unnayan Bahvan, Kolkata)
15. Urban Planning of KMA and Future Role of KMDA by Sen Gupta, Biplab Kanti (Kolkata)
16. Urban Green Space by Sen Gupta, Biplab Kanti (Kolkata)
17. A Presentation of Green Building by Sen Gupta, Biplab Kanti (Ranchi)
18. Sustainable architecture and Biomicing by George, Abraham (IIT Guwahati)

Papers Published in Journals

3. ALTERNATIVE MODELS OF DEVELOPMENT FOR SUSTAINABLE INCLUSIVE GROWTH OF UTTARAKHAND HILL REGION By Nitin Srivastava and Dr. Somnath Sen ABACUS Vol-7, No.-1 (2012)
10. Importance of User Perception in evaluating Level of Service for Bus Transit for a developing country like India: A Review By Shreya Das and Debapratim Pandit Transport Reviews Accepted (2013)
12. Mechanism of wage fixation in agriculture By Dr. Banhi Chakraborty The Indian journal of economics Vol.76,1,p.31-46 (1995)
13. Methodology to determine the service area gaps in bus transit services amongst different user groups: Case study Kolkata, India By Shreya Das and Debapratim Pandit Transport Policy Under Review (0)

14. Methodology to Identify the Gaps in the Level of Service Provided for Urban Bus Transit: Case Study Kolkata. By Shreya Das and Debapratim Pandit SPANDREL 4 (Spring), 59-71 (2012)


Papers Presented in Conferences


10. Methodology to determine commuter preference for a proposed bus rapid transit corridor, By Debapratim Pandit and Shreya Das, 2nd Conference of Transportation Research Group of India (Under Review), Agra, India, (2013)

11. Methodology to determine Level of Service for Bus Transit in a developing country like India, By Shreya Das and Debapratim Pandit, 13th International Computers in Urban Planning and Management Conference (Under review), Utrecht, Netherlands, (2013)


Department of Biotechnology

**Head**
- Prof. Tapas Kumar Maiti  From 01.01.2013

**Professors**
- **Das, Amit Kumar**  Ph.D.(Calcutta Univ), Structural Biology and Biochemistry, Crystallographic study of M.tuberculosis and S. aureus proteins, Structural Bioinformatics
- **Das, Debabrata**  Ph.D.(IIT Delhi), Biohydrogen production processes, CO2 sequestration for algae cultivation, Microbial fuel cell
- **Dey, Satyahari**  Ph.D.(IIT Kharagpur), Bio- prospecting genes & molecules. Molecular profiling Antarctic flora. Nutraceutical development
- **Ghosh, Ananta Kumar**  Ph.D.(Calcutta Univ), Recombinant DNA Technology, Hybridoma Technology, Molecular Virology
- **Ghosh, Sudip Kumar**  Ph.D.(Kalyani Univ), Plant Molecular Biology, Nanobiotechnology, Molecular and Cellular Parasitology
- **Kundu, Subhas Chandra**  Ph.D.(BHU, Varanasi), Cell based tissue engineering and regenerative medicine, Silk biomaterials
- **Maiti, Tapas Kumar**  Ph.D.(Kalyani Univ), Plant lectins and lectin derived peptides in cancer therapy, Mushroom derived glucans as immunomodulators, Biomicrofluidics and biochip development, Tissue engineering through top down and bottom up approach

**Associate Professors**
- **Ghosh, Anindya Sundar**  Ph.D.(Calcutta Univ), Microbial genetics, Antimicrobial chemotherapy, Bacterial biofilm, Physiology and Biochemistry of Penicillin-binding proteins (PBP)
- **Sar, Pinaki**  Ph.D.(BHU, Varanasi), Microbiology of arsenic contaminated groundwater, Microbial diversity and bioremediation, Metagenomics and environmental biotechnology, Microbial bioprospecting, Molecular methods in detection of microbes in drinking water
- **Sen, Ramkrishna**  Ph.D.(IIT Madras), Biosensor, Algal Biofuels and Bio-CCS, Biorefinery, Bioprocess Development Modeling & Optimization, Marine Biotechnology, Biochemical Engineering, Enzymes and Biofuels Technology, Bioenergy, Probiotics and Nutraceuticals, Environmental Biotechnology

**Assistant Professors**
- **Bahadur, Ranjit Prasad**  Ph.D.(Jadavpur Univ), Bioinformatics and Computational Structural Biology
- **Maiti, Mrinal Kumar**  Ph.D.(Calcutta Univ), Metabolic engineering of plant and fungal storage-lipids, Functional genomics of rice plant, Bioprospecting of endophytic microbes for pharmaceuticals

**Faculty Retirement**
- Prof. S C Kundu  Professor

**Faculty Re-employment**
- Prof. S C Kundu  Professor
Brief Description of on-going activities


Thrust Areas


New Acquisitions

1. Peristaltic Pump
2. Cell Disruptor
3. Fume Exhaust Hood Biobase
4. Rota Vapor System
5. HPLC (Analytical)
6. Fluorimeter
7. Phosphoimager
8. Autoclave

International Collaborations

Prof. S. C. Kundu has four collaborative research projects: (iv) Project on Immunogenic responses of silk biomaterial used for cell based tissue engineering and regenerative medicine, Professor Heinz Redll, LBI-Ludwig Boltzmann Institue for experimental and clinical tramatology, Vienna, Professor Martijn van Griensvan, Indo- Austrain (DST-BMWF) in 2011 (two years)

Prof. D. Das has two international collaborative projects: (i) Indian-Norwegian-Swedish collaboration project entitled "BioCO2: An integrated multidisciplinary project using solar energy for production of renewable hydrogen combined with CO2 capture, to address global warming and energy production" sponsored by Norwegian Foreign Ministry, Collaborating Universities: Uslo University, Norway and Uppsala University, Sweden (ii) Indian-Dannish collaborating project entitled "High rate algal biomass production for food, feed, biochemicals and biofuels" sponsored by Department of Biotechnology, Govt. of India. Collaborating Universities: Technical University of Denmark and Copenhagen University, Denmark

Prof. R. Sen has two international collaborative projects: (i) Federal University of Rio-de-Janeiro (Brazil) through DST-CNPq program (Biofuel) (ii) University of Minho, Portugal through DST-Portugal program (Biosurfactant)
**Lectures by Visiting Experts**

1. Novel regulators in cardiac development and angiogenesis by Dr. Chinmoy Patra (Max Planck institute for Heart and Lung Research, Bad Nauheim, Germany)
2. Divergent promoter Architectures employed by budding yeast by Dr. Bhaswar Ghosh (Computational System Biology Lab, Ecole Polytechnique Federeaule de Lausanne, Switzerland)
3. Gut Microbes and Malnourishment: insights from Metagenomics Study by Dr. Sharmila Mande (Head of Bio-Science R&D, TCS Innovation Labs, Tata Consultancy Services Ltd., Pune-411013)
4. Extreme readioresistance of Deinococcus radiodurans: novel opportunities for basic research and application by Dr. S.K.Apte (Associate Director, Bio-medical Group & Head-Mol. Bio Division, Bhabha Atomic Research Centre, Mumbai)
5. Determinants of instability in cancer genomes by Dr. Subhajyoti De, (Asssistant Professor, Department of Medicine, University of Colorado School of Medicine, Associate member, University of Colorado Cancer Center)
6. Interspecies and multispecies crosstalk: Harnessing the biotechnological potential of plant-associated endophytic fungal treasure troves by Dr. Souvik Kusari (Research Scientist, Institute of Environmental Research (INFU), TU Dortmund, Germany)
7. Improving tobacco (Nicotiana tabacum) suspension cells as a molecular farming platform: a protease knock down approach by Dr. Manoj Kumar Mondal (Fraunhofer IME, Aachen, Germany)
8. Development of fluorogenic bio-application based on supramolecular interactions by Dr. Kalyan Kumar Sadhu (Institu de Science et Ingenierie Supramoleculaires (ISIS), Universite de Strasbour, 8 allee Gaspard Monge, Strasbourg)
9. Mechanism of Human TDG in maintaining genetic and epigenetic integrity by Dr. Atanu Maiti (Dept. of Biochemistry & Molecular Biology, University of Maryland School of Medicine, Baltimore, USA)
10. Understanding Signal Transduction at the Molecular Level Using Biological and Chemical Approaches by Dr. Devrani Mitra (University of Chicago, USA)

**Doctoral and MS Degrees Awarded**

1. Mr. Shibendu Sekhar Das (07BT9709) : Isolation, purification and characterization of betacyanins and betanidin glycosyltransferase from Amaranthus tricolor L(Ph.D.)
2. Ms. Sarmishtha Talukdar (08BT9704) : Engineered Silk fibroin matrices for 3D in vitro tissue modeling(Ph.D.)
3. Mr. Sintu Kumar Samanta (08BT9701) : Chitin biosynthesis and protein kinase mediated signaling in encysting Entamoeba(Ph.D.)
4. Mr. Paltu Kumar Dhal (07BT9701) : Molecular analysis of microbial communities in uranium mines and mine tailings and assessment of indigenous bacterial potential for bioremediation(Ph.D.)
5. Ms. Mousumi Biswas (06BT9712) : Betalain production in vitro and DOPA 4.5 dioxygenase mediated biotransformation in Amaranthus tricolor L.(Ph.D.)
6. Ms. Nandana Bhardwaj (08BT9702) : Silk fibroin/chitosan polyelectrolyte complex porous scaffolds as biomaterial for tissue engineering applications(Ph.D.)
7. Mr. Mohan Yama (06BT9701) : Clean Energy Generation using Microbial fuel Cells(Ph.D.)
8. Mr. Soham Chattopadhyaya (08BT9705) : Continuous biocatalytic production and characterization of biodiesel using a renewable vegetable oil as a model feedstock(Ph.D.)
9. Ms. Saumita Kamal Banerjee (08BT9501) : Improved Pre treatment for Enhanced Enzymatic Saccharification and bioethanol Production from Rice Husk as a Model Lignocellulosic feedstock(Ph.D.)

**Member - Professional Bodies**

1. Ghosh, Sudip Kumar, *Life Member* - Indian Science News Association
2. Ghosh, Sudip Kumar, *Life Member* - Society of Biological Chemists, India
3. Sar, Pinaki, *Regular* - American society for microbiology
4. Sar, Pinaki, *Regular* - Europian federation of biotechnology
5. Sen, Ramkrishna, *Life member* - Indian Institute of Chemical Engineers (IIChE)
7. Sen, Ramkrishna, *Member* - Asian Federation of Biotechnology
8. Sen, Ramkrishna, *Member* - European Federation of Biotechnology
10. Ghosh, Anindya Sundar, *Associate Member* - Horticultural Society of India
11. Ghosh, Anindya Sundar, *Ordinary member* - Society of General Microbiology (SGM), UK
12. Ghosh, Anindya Sundar, *Member* - International Society of Travel Medicine (ISTM)
13. Maiti, Mrinal Kumar, *Life Member* - Society for Plant Biochemistry & Biotechnology, IARI, New Delhi
14. Maiti, Mrinal Kumar, *Regular* - American Society of Plant Biologists
15. Maiti, Mrinal Kumar, *Member* - Asian Federation of Biotechnology
16. Maiti, Mrinal Kumar, *Life Member* - Plant Physiology Forum, Kolkata
17. Maiti, Mrinal Kumar, *Life Member* - Institute of Science, Education and Culture (ISEC) Kolkata
18. Bahadur, Ranjit Prasad, *Member* - Asian Federation of Biotechnology
20. Das, Debabrata, *Life member* - Association of Food Scientists & Technologists (India) (AFST)
22. Das, Debabrata, *Regular Member* - International Association of Hydrogen Energy (IAHE)
23. Das, Debabrata, *Life member* - Indian Institute of Chemical Engineers (IChE)
24. Das, Debabrata, *Life member* - The Institution of Engineers (India) (IE)
25. Dey, Satyahari, *Member* - Society for Biotechnology Japan
26. Dey, Satyahari, *Member* - Phytochemical Society of Europe
27. Dey, Satyahari, *Member, Executive Board* - Asian Federation of Biotechnology
29. Kundu, Subhas Chandra, *Elected Member, Asia Specific* - Tissue Engineering and Regenerative Medicine, International Society
30. Kundu, Subhas Chandra, *Life Member* - All India Cell Biology Society
31. Ghosh, Ananta Kumar, *Life member* - Physiological Society of India
32. Ghosh, Ananta Kumar, *Regular* - Biotechnology Society of India
33. Das, Amit Kumar, *Member* - ASM
34. Das, Amit Kumar, *Life* - National Crystallographic Society

**Member - Editorial Board**

2. Bahadur, Ranjit Prasad (2011) *Editorial Board Member* - ISRN Biomathematics
5. Das, Debabrata (2013) *Member of the Editorial board* - Indian Journal of Biotechnology
6. Das, Debabrata (2013) *Member of the Editorial board* - Biotechnology for Biofuels
12. Kundu, Subhas Chandra (2012) *Editorial Board Member* - Biomedical Materials
Awards & Honours

1. Das, Debabrata (2013) Received third prize in the Poster Competition of the International Conference on Algal Biorefinery (ICAB-2013, January 1-12, 2013, IIT Kharagpur)

Fellowships

1. Das, Debabrata (0) Renewable Energy Chair Professor at IIT Kharagpur

Sponsored Research Projects

1. A Dissection of macromolecular interactions in cellular assemblies (ISIRD, Rs.5.00 Lakhs)
2. Algae mediated biosequestration and storage of CO2 (Bio-CCS) from coal-based flue gas and animal feed application (West Bengal Department of Science and Technology, Rs.27.39 Lakhs)
3. Analysis of macromolecular interactions in ribosome: implication to its self assembly (Sponsor:Submitted (DST (awarded), Rs.18.60 Lakhs)
4. Assessment of microbial communities and their biodegradation potentials in petroleum hydrocarbon contaminated environments in Assam (Department of Biotechnology, Rs.62.00 Lakhs)
5. Biofuel production in a biorefinery concept (PBC) (P K Sinha Center for Bioenergy - IIT Kharagpur, Rs.3.00 Lakhs)
6. Biofuels from marine microalgae (BMM) (CSIR (under NMITLI program), Rs.59.30 Lakhs)
7. Bioinformatics SUB-DIC (DBT, New Delhi, Rs.8.60 Lakhs)
8. Bioprocess development and bioreactor strategies for the probiotic endospores for the lab scale manufacture of nutraceuticals (MNF) - Complete (CSIR, Rs.16.00 Lakhs)
9. Bioprocess development and optimization for the enhanced production of biosurfactants of marine origin for healthcare and commercial applications (HCA (DBT, Rs.36.16 Lakhs)
10. Bioprospecting antarctic microflora (MoES, Rs.105.00 Lakhs)
11. Bioprospecting of antarctic flora: screening of novel genes and healthcare molecules (Ministry of Earth Sciences, Rs.105.96 Lakhs)
12. Biotechnology based value addition of neem and jatropha leaves, oilcakes and oil (NOVOD, Rs.11.00 Lakhs)
13. Characterization of arsenic oxidizing bacteria from contaminated groundwater and their mechanisms of arsenite oxidation process for potential applicat (Council of Scientific and Industrial Research, Rs.27.30 Lakhs)
14. Characterization of a novel short chain dehydrogenase reductase (SDR) family enzyme involved in fatty acid metabolism in M. tuberculosis and structure (DBT, GoI, Rs.76.70 Lakhs)
15. Characterization of encystation specific kinase(s) of Entamoeba during encystation (DBT, Rs.35.98 Lakhs)
16. Continuous process for enzymatic biofuel production - Grant for exchange visit and project formulation - Completed (DST (India)-CNPq (Brazil), Rs.1.50 Lakhs)
17. Crystal structure determination, kinetic and biophysical characterization of glyceraldehyde 3 phosphate dehydrogenase from MRSA 252 (BRNS - DAE, Rs.3140500.00 Lakhs)
18. Deciphering the structure and function of SuhB analogue protein from S. aureus (DST, GoI, Rs.33.98 Lakhs)
19. Development and characterization of ecofriendly jute geo-composites (EFB) (JMDC, Rs.67.00 Lakhs)
20. Development of fluorescent whole cell optical fibre biosensor for heavy metal pollutants (DBT, Rs.31.79 Lakhs)
21. Development of multifunctional dendritic polymers for injectable bone tissue engineering (DBT, Rs.37.10 Lakhs)
22. Development of water-repellant and durable jute geotextiles (JGN) (JMDC, Rs.170.00 Lakhs)
23. Droplet-Based screening of amyloidB-peptide aggregation-DBT (DBT, Rs.43.44 Lakhs)
24. Effects of auxiliary membrane components on biofilm formation in Escherichia coli (Council of Scientific and Industrial Research (CSIR), Rs.24.76 Lakhs)
25. Engineered silk matrices for optimization of in vitro 3-D tumor model (ICMR, New Delhi (sanctioned), Rs.46.90 Lakhs)
26. Enhanced production and purification of a marine lipopeptide for breast cancer therapy (BCT) (MoES, Rs.100.36 Lakhs)
27. Evaluation of Potential applications in Drug Delivery of some novel pH responsive biocompatible and biodegradable hydrophobically modified polymers (DST, Rs.35.00 Lakhs)
28. Exploration of microbial diversity and microbial role in arsenic mobilization in As-contaminated groundwater of North Eastern states (Arunachal Pradeh (Department of Biotechnology, Rs.68.28 Lakhs)
29. Extraction, characterization and optimized production of biopigment from Amaranthus tricolor (ACA) - Completed (DBT, Rs.24.41 Lakhs)
30. Functional characterization of soluble penicillin-binding protein 6 of E. coli (Department of Science and Technology, Govt. of India, Rs.22.86 Lakhs)
31. High rate algal biomass production for food, feed, biochemicals and biofuels (Department of Biotechnology, Rs.66.56 Lakhs)
32. Identification and characterization of Phaseolus vulgaris microRNAs differentially expressed in biotic and abiotic stress conditions by deep sequen (DBT, Rs.2.99 Lakhs)
33. Identification and characterization of molecular tools in order to generate improved jute cultivers (Council of Scientific and Industrial Research, Rs.16.76 Lakhs)
34. Immunogenic responses of silk biomaterials used for cell based tissue engineering and regenerative medicine. (Indo Austria, DST, Rs.7.03 Lakhs)
35. Indian origin silk based biomimetic scaffolds for engineering of load-bearing tissue (Department of Biotechnology, New Delhi, Rs.54.45 Lakhs)
36. Molecular and structural analysis of Antheraea mylitta cytoplasmic polyhedrosis virus RNA dependent RNA polymerase. (DST, Rs.39.70 Lakhs)
37. Molecular characterization of DacD (a putative DD-carboxypeptidase) of Escherichia coli (DBT, Rs.20.86 Lakhs)
38. Molecular characterization of the emerging beta-lactamases in Gram negative bacilli (Department of Biotechnology, Rs.100.51 Lakhs)
39. Molecular cloning and characterization of Antheraea mylitta cytoplasmic polyhedrosis virus genome segments 4 and 5 (CSIR, Rs.29.00 Lakhs)
40. Molecular Structural analysis of A mylitta cytoplasmic polyhedrosis virus RNA dependent RNA polymerase. (DST-SERB, G Ol, Rs.3970000.00 Lakhs)
41. North Eastern origin silk protein based matrices and nano/microparticles for biomedical applications (Department of Biotechnology, New Delhi, Rs.118.35 Lakhs)
42. Nutritional enhancement of rice bran oil through metabolic engineering of fatty acid biosynthesis (CSIR/Govt. of India, Rs.22.82 Lakhs)
43. P K Sinha Center for Bioenergy (PKS) (IIT Foundation (Dr. Prabha Kant Sinha), Rs.400.00 Lakhs)
44. Periferal nerve regeneration on silk matrices (British Council, Rs.13.00 Lakhs)
45. Potential use of biosurfactants for medical applications (PBM) (DST (under Indo-Portugal Collaboration Program), Rs.4.14 Lakhs)
46. Protein-protein interface targeted drug designing (DBT - New Delhi, Rs.3060000.00 Lakhs)
47. Reducing accumulation of toxic metals or metalloids in rice grains by RNAi-mediated gene silencing approach (DBT/Govt. of India, Rs.29.81 Lakhs)
48. Role of Penicillin-binding proteins and O-antigens in the development of beta-lactam antibiotic resistance in Gram negative bacteria (Indian Council of Medical Research (ICMR), Rs.17.40 Lakhs)
49. Search for local isolates of oleaginous micro-organism as potential source of biodiesel production (ISIRD, SRIC, IIT-KGP, Rs.4.96 Lakhs)
50. Silk Protein/Blend Matrices in Tissue Engineering & Biotechnological Applications (Department of Science & Technology, Rs.41.43 Lakhs)
51. Technology Mission Mode Project on “Hydrogen Production through Biological Routes” (MNRE, Govt. of India, Rs.287.00 Lakhs)
52. Integrating large scale biohydrogen production and hydrogen fuel cell for sustainable power generation (DRDO, Rs.9.99 Lakhs)
Consultancy Projects

1. Biocatalyst based continuous production of biodiesel (PfP Technology LLC., Houston, Texas, USA, Rs.11.00 Lakhs)
2. Calculation alcohol loss in the Distillery Plant (IFB Agro Industries Ltd., Noorpur, Rs.4.00 Lakhs)
3. Establishment of Biotechnology Park Kharagpur: Concept paper (WBIDC, Rs.27.00 Lakhs)
4. Validation trial for bioethanol production (VTBP) - Completed (DSS Corp., Kolkata, Rs.0.25 Lakhs)

Patents (filed / granted)

1. 1,4 triazole based polyphenol hybrids - in vitro inhibition of M. tuberculosis b-ketoacyl reductase FabG4 9Rv0242c) by Debranjan Banerjee, D Dutta, B Saha, A K Das, Amit Basak
2. A biofuel additive for diesel engines
3. A novel microbial carbon capture cell design for simultaneous wastewater treatment and CO2 biofixation
5. An efficient, cost-effective, reusable and eco-friendly algal biomass dewatering system and an accelerated adsorption process thereof
6. Anticancer cyclic peptide from sandalwood and synthesis of the same
7. Antimicrobial peptide from jatropha
8. Continuous bio-catalytic production of bio-diesel in an integrated CSTR-PBR operation
9. Cost-effective natural salt formulation for sea water substitution, ...... precipitation thereof
10. Durability enhancement of lignocellulosic fibers by vegetable oil treatment
11. Earthen material based cathode separator assembly for scalable bioelectrochemical system.
13. Microbial transformation of lignocellulosic fibers using eco-friendly reagents for strength and durability enhancement
14. Natural resins and the use thereof for the production of jute fiber reinforced composites
15. Probiotic spore based novel drug delivery system

Visits Abroad by Faculty Members

1. Kundu, Subhas Chandra - Invited lecture (Linkopings University, Sweden, ) May 19-21, 2012
2. Kundu, Subhas Chandra - Key Note Speaker, TERMIS World Congress (Vienna, Austria, ) September 05-08, 2012
3. Das, Debabrata - Discussion on the Indo-Danish research project and seminar talk (Denmark Technical University, Denmark, ) June 11-24, 2012
4. Das, Debabrata - Session Chair, Bioenergy & Biorefinery section, International Biotechnology Symposium (IBS-2012) and (International Biotechnology Symposium and Exhibition (IBS-2012)Daegu, South Korea, ) 13-21 September, 2012
5. Kundu, Subhas Chandra - Collaborative resarch with Dr. Heinz Reidl and Dr. Martijin van Griensvan (LBI-Ludwig-Boltzmann Institute, Vienna, Austria, ) May 24-27, 2012
7. Dey, Satyahari - Invited lecture, AFOB Symposium 2012 (Daegu, South Korea, ) September 19-20, 2012
9. Sen, Ramkrishna - To fulfill some of the objectives of the DST Indo-Portugal Collaborative Project (SRIC coode: PBM) (University of Minho, Braga, Portugal, ) September 20 - 29, 2013
10. Maiti, Tapas Kumar - To attend the workshop on Biomicrofluidics and Micro-scale Bioengineering (University of Southampton. ) 4days
11. Sar, Pinaki - Participating the metagenomics workshop (Joint Genome Institute, Walnut Creek, USA, ) 10th-14th Sept. 2012
12. Sar, Pinaki - Attending the international conference (ISME 14) (Copenhagen, 19-24th August, 2012)
13. Sar, Pinaki - Strengthen the collaboration on proposed water resource research centre (University of California, Berkley, 12th Sept. 2012)
14. Bahadur, Ranjit Prasad - To attend and give a poster presentation in EPSO Plant Biology Congress (Freiburg, Germany, 29th July-3rd August)

**Invited Lectures by Faculty Members**

1. Non-essential penicillin binding proteins (PBPs) maintain an intrinsic beta-lactam resistance in *Escherichia coli* by Ghosh, Anindya Sundar (Workshop on Microbial Biology, Hyderabad,)
2. What makes three redundant DD-carboxypeptidases of *Escherichia coli* behave functionally different in by Ghosh, Anindya Sundar (Annual Meeting of Society for Biological Chemists)
3. PCR based DNA fingerprinting by Ghosh, Anindya Sundar (Assam University Silchar, Biotech Hub)
4. Protein-Protein interaction in microfluidic platform and its application in Glycobiology by Maiti, Tapas Kumar (University of Southampton)
5. Immunotherapeutic and anticancer potential of various ethnic medicinal mushroom derived glucans by Maiti, Tapas Kumar (Thirissur, Kerala)
6. Problems and prospects of edible mushroom derived immunomodulatory glucans: by Maiti, Tapas Kumar (CETRI, Mysore)
7. A Perspective on Computational Structural Biology by Bahadur, Ranjit Prasad (OUAT, Bhubaneswar)
8. Structural analysis of protein-RNA recognition sites by Bahadur, Ranjit Prasad (Centra University of Tezpur)
9. Petroleum Microbiology by Sar, Pinaki (IIT Kharagpur)
10. Advances in biohydrogen production processes: present state of art by Das, Debabrata (National Renewable Energy Fellows Convention, MNRE, New Delhi)
12. Improvement of biohydrogen production from the organic wastes by Das, Debabrata (International Symposium on New horizon in Bioenergy Research*, IIT Kharagpur)
14. DNA Sequencing by Ghosh, Ananta Kumar (Vidyasagar University)
15. Improvement of energy recovery from cane molasses by dark Fermentation followed by microbial fuel by Das, Debabrata (15th International Biotechnology Symposium and Exhibition (IBAS-2012), Daegu, South Korea)
16. Biohydrogen production: towards a sustainable energy system by Das, Debabrata (JNTU, Hyderabad (ICABHPA-2012))
17. Algae as food, feed, biofuel and biochemicals: Present state of art. by Das, Debabrata (ICAB-2013, IIT Kharagpur)
18. Fermented foods-safety and quality aspects by Das, Debabrata (Short term course on Food Safety and Quality Management (FSQM), IIT Kharagpur)
19. Nonmulberry silk biomaterial for regenerative medicine by Kundu, Subhas Chandra (Wurzburg, Germany)
20. Cell based tissue engineering and biomolecule delivery by Kundu, Subhas Chandra (Linkokings University, Sweden)
21. Silk biomaterials for tissue engineering by Kundu, Subhas Chandra (Max-Plqncck-Institute for Heart and Lungs Germany)
22. Nonmulberry silk biopolymer as emerging natural biomaterials by Kundu, Subhas Chandra (Vienna, Austria)
23. Biomaterials for drug delivery by Kundu, Subhas Chandra (Visva-Bharati, Santineketan)
24. Natural biomaterials for regenerative medicine by Kundu, Subhas Chandra (Manipal University, Bangalore)
25. Engineering of Indian origin silk matrices for tissue engineering and regenerative medicine by Kundu, Subhas Chandra (IIT Kharagpur (ICRRM))
26. Indian origin natural smart silk biopolymers for regenerative medicine by Kundu, Subhas Chandra (IIT Kharagpur (ICRRM))
27. Bio-inspired processes & products vis-à-vis my R&D activities with industrial BT focus & perspective by Sen, Ramkrishna (DuPont India R&D Centre, Hyderabad)
28. Current trends in biosurfactant research vis-a-vis our R&D - New horizons and Opportunities by Sen, Ramkrishna (University of Minho, Portugal)
29. Holistic views of a layman on refining the green crude for human good by Sen, Ramkrishna (IIT Kharagpur - ICAB - 2013)
30. A journey through the challenges of biofuels with some relevant case studies by Sen, Ramkrishna (IIT Kharagpur - NHBR - 2013)
31. Holistic strategy to capitalize on energy environ water nexus in biorefinery model:Our R&D Solutions by Sen, Ramkrishna (Nagpur (IC-IMPACTS Workshop - 2013))
33. Collaboration between Asian regions in Biotechnology: Networking AFOB resources for strengthening ov by Dey, Satyajari (Daegu, South Korea)
34. Non-heterocystous cyanobacteria: prospective source of nutraceuticals, cosmeceuticals and others by Dey, Satyajari (IIT Kharagpur)
35. Encystation signal and cyst wall synthesis in Entamoeba invadens signal in Entamoeba invadens by Ghosh, Sudip Kumar (81st Annual meeting of SBC(I), Kolkata)
36. Chitin biosynthesis pathway and Encystation signal in Entamoeba invadens by Ghosh, Sudip Kumar (Indo Uk Meeting on Parasitology, Kolkata)

Papers Published in Journals


23. Drug loading and release on tumour cells using silk fibroin- albumin nanoparticles as carriers By Subia B, Kundu SC Nanotechnology 24 03510 (2013)


25. Engineered 3D silk based metastasis models: Interactions between human breast adenocarcinoma, mesenchymal stem cells and osteoblast-like cells By Talukdar S, Kundu SC Advanced Functional Materials Accepted (2013)


70. Silk sericin/polyacrylamide in situ forming hydrogels for dermal reconstruction By Kundu, B and SC Kundu Biomaterials 33:7456-7467 (2012)
81. Sub-inhibitory cefsulodin sensitization of E. coli to beta-lactams is mediated by PBP1b inhibition By Sujoy K. Sarkar, Mouparna Dutta, Akash Kumar, Dhriti Mallik and Anindya S. Ghosh* PLOS ONE 7(11): e48598 (2012)
85. The promotion of osseointegration of titanium surfaces by coating with silk protein sericin By Nayak S, Naskar D, Dey T, Kundu SC Biomaterials 34: 2855-2864 (2013)
Papers Presented in Conferences


25. Encystation signal and cyst wall synthesis in Entamoeba invadens, By Sudip K. GHosh, *81st Meeting of Society of Biological Chemists (I) and Symposium on Chemistry and Biology: Two weapons against Diseases*, Kolkata, (2012)


37. Improvement of hydrogen production with thermophilic isolate Thermoanaerobacterium thermosacharolyticum ST1, By Roy S and Das D, International conference on Advances in biological hydrogen production and applications (ICABPHA), JNTU, Hyderabad, (2012)
38. Improvement of phycobiliprotein production by Nostoc sp., (IIT Kgp) through suitable culture conditions and media optimization, By Eldin M.J. and Das D, International Conference on Algal Biorefinery (ICAB-2013), IIT Kharagpur, (2013)
40. Inhibitory effects of sandalwood peptides on human breast cancer cell lines, By Abheepsa Mishra, SS Das, SS Gauri, S Mukherjee, S Chatterjee, M Patra, J Misra, A Kumar & S Dey, 4th Indian Peptide symposium, Kolkata, (2013)
41. Isolation and characterization of bioactive compounds/peptides from a new cyanobacterial isolate of microalga Lyngbya sp., By SS Gauri & S Dey, IBS-2012, Daegu, South Korea, (2012)
42. Isolation and characterization of bioactive oligopeptides from rice bran, By Jigni Misra, Abheepsa Mishra, SS Das, SS Gauri, S Mukherjee, S Chatterjee, M Patra, A Kumar & S Dey, 4th Indian Peptide symposium, Kolkata, (2013)
44. Isolation of transposon mutant of Escherichia coli with altered biofilm formation, By Akash Kumar, Dhanasingh, Anindya S. Ghosh*, 3rd World Congress on Biotechnology., HICC, Hyderabad, India, (2012)
45. MGM workshop, By Pinaki Sar, Microbial Genomics and Metagenomics, Joint Genome Institute, Walnut Creek, US, (2012)
47. Molecular characterization of a MATE family gene in relation to arsenic transport or accumulation in indica rice grain, By Natasha Das, Somnath Bhattacharyya and Mrinal K. Maiti, National Symposium on Plant Tissue Culture & Biotechnology for Food and Nutritional Security, Mysore, India, (2013)
50. Molecular modeling of protein-protein interaction to decipher the structural mechanism of nonhost resistance in rice, By Ranjit P Bahadur & Jolly Basak, Plant Biology Congress Freiburg, Germany, (2012)
52. Non-mulberry silk biopolymer as emerging natural biomaterial, By Kundu SC, 3rd World Congress of TERMIS, Vienna, Austria, (2012)
54. Novel Encystation Specific Protein Kinases in Entamoeba invadens, By Sintu Samanta, Biswajit Saha, Mithu Baidya, Tanya Singh and Sudip K. ghosh, 81st Meeting of Society of Biological Chemists (I) and Symposium on Chemistry and Biology: Two weapons against Diseases, Kolkata, (2012)
55. of Indian origin silk matrices for tissue engineering and regenerative medicine, By Kundu SC, Intert. Conf. on Design of Biomaterials, Indian Institute of Sciences, Bangalore, India, (2012)


59. Silk nanoparticles incorporated 3D porous scaffolds for delivery of TGF β -1 in human mesenchymal stem cells, By Subia B, Talukdar S, Kundu SC, 3rd World Congress of TERMIS, Vienna, Austria, (2012)

Department of Chemical Engineering

Head
Prof. Narayan Chandra Pradhan

Professors
Basu, Jayanta Kumar  Ph.D.(IIT Kharagpur), Adsorption and Separation Science, Waste Water Treatment, Reaction Engineering
Das, Gargi  Ph.D.(IIT Kharagpur), Multiphase flow, Two phase instrumentation, CFD simulation
DasGupta, Sunando  Ph.D.(RPI, USA), Microscale Transport Process and Microfluidics
De, Sirshendu  Ph.D.(IIT Kanpur), Membrane separations, Transport Processes, Flow through microchannels
Kundu, Gautam  Ph.D.(IIT Kharagpur), Multiphase Operation, Mineral Beneficiation, Rheology of Suspension
Mukherjee, Dibyendu  Ph.D.(IIT Kharagpur), Multi Phase Flow, Column Flotation, Modeling & Simulation
Neogi, Sudarsan  Ph.D.(Ohio Univ.,USA), Surface Modification And Engineering of Polymer Substrates For Biomedical Applications, Plasma Enhanced Chemical Vapor Deposition, Plasma Sterilization, Adhesive Development, Antimicrobial Coatings, Modeling And Simulation Of Chemical Process Plant, Environmental Pollution Control, Polymer Composites
Pradhan, Narayan Chandra  Ph.D.(UDCT Bombay), Heterogeneous Catalysis, Chemical Process Development, Petrochemical Technology, Petroleum Refining, Separations Technology

Associate Professors
Chakraborty, Sudipto  Ph.D.(IIT Kharagpur), Process Modelling and Simulation, CFD & Heat Transfer, Ultra-fast cooling of steel, Coal and mineral beneficiation
Jana, Amiya Kumar  Ph.D.(IIT Kharagpur), Renewable energy, Energy intensification, Nonlinear control, Modeling and simulation
Kar, Debdlulal  Ph.D.(IIT Kharagpur), Mineral Processing, Fluidization Engineering, Biogas Development
Meikap, Bhim Charan  Ph.D.(IIT Kharagpur), Pollution Control, Coal Benificiation, CO2 Capturing, Fluidization
Mukherjee, Rabibrata  Ph.D.(IIT Kanpur), Polymer Thin Film Instability, Soft Lithography, Structural Super Hydrophobicity, Polymer Blends, Soft Condensed Matter
Neogi, Swati  Ph. D.(Ohio University),

Assistant Professors
Atta, Arnab  Ph.D. (IIT Delhi), Computational Fluid Dynamics, Multiphase Flow, Complex Fluids, Process Intensification, Interfacial Science and Engineering
Chakrabarty, Saikat  Ph.D.(Univ. of Houston), Chemical Reaction Engineering, Biomedical Engineering, Bioenergy
Chakraborty, Jayanta  Ph.D.(IISc., Bangalore), Particle technology, Population balance modeling, Synthesis of nanoparticles, Crystallization, Manufacturing of nanomaterial based solar cells
Deshpande, Parag Arvind  
Ph.D.(IISc., Bangalore), Electronic structure calculations, Computational organic chemistry and catalysis, First principles analysis of physiological reactions

G, Harikrishnan  
Ph.D.(IIT Bombay), polymeric foams, polymer nanocomposites, rheology, polymeric coatings

Ganguly, Somenath  
Ph.D.(Univ. of Kansas, USA), Flow in thin channel and porous media, Hydrogel, Improved recovery of hydrocarbon

Padmanabhan, Venkat  

Ray, Subhabrata  
M.Tech.(IIT Kharagpur), Optimization and control of fed-batch bioreactors, Crystallization process modeling and control, Multi-objective optimization: Genetic Algorithms, Multivariate image analysis

Sengupta, Sonali  
Ph.D.(UDCT Mumbai), Reaction Engineering, Petroleum engineering, Heterogeneous and Homogeneous Catalysis

Faculty Appointments

Amab Atta  
Assistant Professor

Brief Description of on-going activities


Thrust Areas


New Acquisitions

1. Gas Chromotograph System
2. HPLC
3. High Performance Cluster
4. Atomic Absorption Spectrophotometry Unit
5. Automated Surface Area & Pore Size Analyzer
6. Evaporation Unit & Liquid Nitrogen Container

**International Collaborations**


**Lectures by Visiting Experts**

1. Multi-Functional Materials Based On Aerogels and Novel Polymer Nanofibers by Sadhan C. Jana (Department of Polymer Engineering, University of Akron)
2. Dense Granular Flows: Rheology and Segregation by Devang Khakhar (IIT Bombay)
3. Colloid and Material Science Research in Academia and Industry: A chemical Engineers perspective by Kaustav Ghosh (Whirlpool Corporation, Michigan, USA)
4. Reaction Mechanisms and the Design of Heterogeneous Catalysts for Sustainable Energy by M. Ali Hyder (University of Virginia)
5. Breaking the Tradition: Whole Crude Oil Hydrotreating by I.M. Mujtaba (University of Bradford, UK)

**Doctoral and MS Degrees Awarded**

2. Sudeshna Roy : Dewetting, Pattern Formation, and Stability of Thin Polymer Films(Ph.D.)
3. Debadrita Maiti : Heat Integrated Batch Distillation with a Jacketed Reboiler(Ph.D.)
4. Satyabrata Mohanta : Dry beneficiation of high ash Indian thermal coal in an air dense medium fluidized bed(Ph.D.)
5. Vivek Kumar : Performance Improvement of Hydrocyclone used for Fine Particle Separation(Ph.D.)

**Member - Professional Bodies**

1. Das, Gargi, *Life member* - Indian Institute of Chemical Engineers
2. Sengupta, Sonali, *Life-member* - Indian Institute of Chemical Engineers
3. Sengupta, Sonali, - Catalysis Society of India
4. Meikap, Bhim Charan, *Member* - International Water Association (IWA), UK
5. Meikap, Bhim Charan, *Life Member* - Indian Institute of Metals
6. Meikap, Bhim Charan, *Member* - American Institute of Chemical Engineers (AIChE)
7. Meikap, Bhim Charan, *Member* - Canadian Institute of Chemical Engineering
8. Meikap, Bhim Charan, *Life Member* - Indian Institute of Chemical Engineers
9. Meikap, Bhim Charan, *Member* - Institution of Chemical Engineers (IChemE), UK
10. Meikap, Bhim Charan, *Member* - The South African Institute of Chemical Engineers(SAIChe)
11. Meikap, Bhim Charan, *Life Member* - Indian Institute of Public Health Engineers (IPHE)
12. Chakraborty, Sudipto, *Life Member* - IICHE
13. Chakraborty, Sudipto, *Life Member* - IIM
14. Chakraborty, Sudipto, *Life Member* - IE(I)
15. Neogi, Sudarsan, *Member* - Refrigerants in Cold Storage review Committee, WBPCB, Govt. of West Bengal
16. Neogi, Sudarsan, *Member of Gov. Body* - Institute of Environmental Studies and Wetland Management, Govt. of West Bengal
17. Neogi, Sudarsan, Member - Municipal Solid Waste Disposal Committee, WBPCB, Govt. of West Bengal
18. Neogi, Sudarsan, Member - Mobile Tower Radiation Committee by Ministry of Environment, Govt. of West Bengal
19. Neogi, Sudarsan, Member - Performance Review Committee WBPCB, Govt. of West Bengal
20. Neogi, Sudarsan, Chairman - State Level Expert Appraisal Committee, Govt. of India
21. Neogi, Sudarsan, Member - Indian Institute of Chemical Engineers
22. Neogi, Sudarsan, Member - Administrative Committee WBPCB, Govt. of West Bengal
23. Neogi, Sudarsan, Member - Sponge Iron Industries : Status of Environmental Pollution Investigation Committee by Ministry of Environment, Govt. of West Bengal
24. Neogi, Sudarsan, Member - West Bengal Pollution Control Board
25. Neogi, Sudarsan, Technical Advisor - Ministry of Environment, Govt. of West Bengal
26. Chakrabarty, Saikat, Life Member - Indian Institute of Chemical Engineers
27. Jana, Amiya Kumar, Life Member - Indian Institute of Chemical Engineers (IIChE)
28. Jana, Amiya Kumar, Life Member - Indian Society for Technical Education (ISTE)
29. Ganguly, Somenath, Senior Member - American Institute of Chemical Engineers
30. Ganguly, Somenath, Life Member - Indian Institute of Chemical Engineers
31. Mukherjee, Rabibrata, Life Member - Indian Ceramic Society
32. Mukherjee, Rabibrata, Life Member - Materials Research Society of India
33. Mukherjee, Rabibrata, Life Member - Indian Institute of Chemical Engineers (IIChE)
34. Sarkar, Debasis, Associate Member - The Institution of Engineers (India)
35. Sarkar, Debasis, Associate Member - Indian Institute of Chemical Engineers
36. Mukherjee, Dibyendu, Life Member - Indian Institute of Chemical Engineers
37. Mukherjee, Dibyendu, Life Member - Indian Institute of Mineral Engineers
38. Kundu, Gautam, Life Member - Indian Society of Theoretical and Applied Mechanics
39. Kundu, Gautam, Life Member - Indian Institute of Chemical Engineers
40. Kundu, Gautam, Life Member - Indian Institute of Mineral Engineers
41. Basu, Jayanta Kumar, Life Member - Indian Institute of Chemical Engineers
42. Pradhan, Narayan Chandra, Life Member - Indian Institute of Chemical Engineers
43. De, Sirshendu, Life Member - Indian Institute of Chemical Engineering
44. De, Sirshendu, Life Member - Indian Society of Theoretical and Applied Mechanics
45. Padmanabhan, Venkat, - American Physical Society (APS)
46. Padmanabhan, Venkat, - Division of Polymer Physics (DPOLY)
47. Padmanabhan, Venkat, - Division of Biological Physics (DBIO)

Member - Editorial Board

2. Chakrabarty, Saikat (2009) Honorary Editorial Board Member - International Journal of Medical Sciences and Technology

Awards & Honours

1. De, Sirshendu (2012) DAE-SRC Outstanding Investigator Award, from Department of Atomic Energy, Govt. of India.
2. Neogi, Sudarsan () Recipient of University of Calcutta Young Alumnus Award
3. De, Sirshendu (2012) Silver Jubilee Young Engineer Award from Indian National Academy of Engineering, New Delhi

Sponsored Research Projects

1. A novel approach to a selective catalytic process for reducing thiophenic sulphur content from petroleum products (Council of scientific and industrial research, Rs.7.00 Lakhs)
2. A study of Microscale transport processes leading to the development of a cooling strategy for electronic components (Department of Information Technology, Rs.89.76 Lakhs)
3. Advanced Material Processing using Radiofrequency Plasma for Biomedical Applications (DST, Govt of India, Rs.0.00 Lakhs)

4. Ammonia Production By Using Urea For Flue Gas Conditioning (FGC) (National Thermal Power Corporation (NTPC), New Delhi, Rs.0.00 Lakhs)

5. Antimicrobial Coating on Plasma Treated substrates for biomedical application (Life Science Research Board, DRDO, Rs.20.00 Lakhs)

6. Bio Gas Development & Training center (Ministry of New & Renewable Energy, Rs.10.00 Lakhs)

7. Design, analysis and control of internally heat integrated distillation columns (DST, Rs.0.00 Lakhs)

8. Design, Modeling and Control of a High Pressure Pilot Scale HIX Reactive Distillation (DAE, BARC, Rs.0.00 Lakhs)

9. Development and characterization of a high efficiency wet scrubber with internals for air pollution control (IIT Kharagpur, Rs.0.00 Lakhs)

10. Development of experimental setup and study on upgradation of high ash Indian coal (DES) (Tata Steel, Jamshedpur, Rs.20.00 Lakhs)

11. Development of Nano FRP Composites for Marine Applications sponsored by Naval Research Board (DRDO, Govt. of India, Rs.0.00 Lakhs)

12. Droplet based microfluidics for electronics cooling (Intel Corporation, Rs.20.15 Lakhs)

13. Droplet based screening of Amyloid β-peptide aggregation (DBT, Rs.43.44 Lakhs)

14. Enzymatic Hydrolysis and Chemical Fermentation of Cellulose for Bioethanol Production (IIT Foundation, Rs.5.00 Lakhs)

15. Estimation of Life time & Life Cycle cost of FRP Pipes manufactured using various technologies for Offshore and Onshore Application. (ONGC, Rs.30.00 Lakhs)

16. Fabrication and Durability Studies of Structured Superhydrophobic Surfaces (GRO Program, Samsung, Korea, Rs.63.30 Lakhs)

17. Fabrication of Nanostructured Surfaces by Soft Lithographic & Non Lithographic Techniques (Solar Energy Research Initiative (SERI), DST, Govt. of India, Rs.80.39 Lakhs)

18. Field Trial of Low Cost Laterite Based Arsenic Filter: Domestic and Community Scale (Department of Science & Technology (DST), Govt. of India, Rs.19.99 Lakhs)

19. Foam-gel formation in thin layer with flow complexities affecting the placement (DST, Rs.35.00 Lakhs)

20. Heat Transfer, Simulation and Measurement of Thermal properties of Sheet Molding Compound (CSP plastics, Troy, Michigan USA, Rs.0.00 Lakhs)

21. Hydrodynamic interactions and force measurements of the nematode Caenorhabditis elegans (ISIRD, SRIC, IIT Kharagpur, Rs.500000.00 Lakhs)

22. Hydrodynamic Study of Vortex and Air-Core Formation in a Two Phase Flow for Simple Geometries (FSG) (Tata Steel Limited, Jamshedpur, Rs.0.00 Lakhs)

23. Hydrodynamics Studies on Micro Bubble Generators (MBG) (M/s Tata Steel, Jamshedpur, Rs.0.00 Lakhs)

24. In silico mechanistic investigations of de novo synthesis of mycobacterium tuberculosis DNA (ISIRD SRIC IIT Kharagpur, Rs.5.00 Lakhs)

25. Indo-US Centre on Fabrionics (Indo-US Science and Technology Forum, Rs.495.00 Lakhs)

26. Instability and Pattern Formation in Thin Polymer Bilayers (DST Nano Mission, Rs.52.20 Lakhs)

27. Locomotion and chemotaxis of the nematode Caenorhabditis elegans in complex media (DST, New Delhi, Rs.2715600.00 Lakhs)

28. Modeling, Analysis and Control of Reactive Distillation Columns (CSIR, New Delhi, Rs.0.00 Lakhs)

29. MODELLING OF THE ELECTROTHERMAL PROCESS OF MAGNESIUM PRODUCTION AND PROCESS OPTIMIZATION (NML, Jamshedpur, Rs.7.20 Lakhs)

30. National Renewable Fellowships (MNRE, Rs.61.76 Lakhs)

31. Optimization of batch crystallization processes under uncertainty (ISIRD Grant of SRIC, IIT Kharagpur, Rs.5.00 Lakhs)

32. Performance Characterization of a Hydrocyclone with Internals for Separation of Fine Particles (CSIR, New Delhi, Rs.0.00 Lakhs)

33. Performance Evaluation of Bag Filters in the Sponge Iron Plants in Orissa-Field Investigation (BFS) (State Pollution Control Board, Orissa (Ministry of Environment & Forest, Govt. of Orissa), Rs.0.00 Lakhs)
34. Performance Evaluation of Bag Filters in the Sponge Iron Plants in Orissa-Field Investigation (BFS) Phse-II (PEO) (State Pollution Control Board, Orissa (Ministry of Environment & Forest, Govt. of Orissa), Rs.0.00 Lakhs)

35. Performance Study of a Hydrocyclone (HDR) (M/s Tata Steel, Jamshedpur, Rs.0.00 Lakhs)

36. PK Sinha Center Project (IIT Foundation, Rs.1000.00 Lakhs)

37. Plasma Treatment of SMC on Surface Energy and Orange Peel Index of Painted Substrates (CSP Plastics, Troy, Michigan, USA, Rs.0.00 Lakhs)

38. Process Simulation and Material Balance of Uran Plant (ONGC, Rs.6.50 Lakhs)

39. Processing of tender coconut water using membrane filtration (Technoeagles Pvt Ltd., Rs.10.00 Lakhs)

40. Production of low cost hollow fiber hemodialysis cartridge (DST, Rs.35.70 Lakhs)

41. Production of monodispersed nanoparticles for a large class of materials using heat treatment based post processing technique (ISIRD SRIC IIT Kharagpur, Rs.8.50 Lakhs)

42. Production of Synthesis Gas and Its Clean Processing by a Multi-Stage Wet Scrubber (Department of Science & Technology (DST), Govt. of India, Rs.10.35 Lakhs)

43. Production of synthesis gas and its clean processing by a multi-Stage wet scrubber (PSG) (DST, Rs.10.35 Lakhs)

44. Rapid DNA hybridization in microfluidic channels (DBT, Rs.42.00 Lakhs)

45. Renewable Resource/Bio based Low Density SMC Development (CSP Plastics, Troy, Michigan, USA (Co-investigator), Rs.0.00 Lakhs)

46. Steel Technology Centre (TCB) (Ministry of Steel & DST, New Delhi, Rs.2025.00 Lakhs)

47. Studies on Effective Use of Microwave Energy for Green Mineral Beneficiation and Pipe Line Slurry Transport (MEG) (Council of Scientific and Industrial Research (CSIR), New Delhi, Rs.0.00 Lakhs)

48. Theoretical and experimental analysis of evaporation in the grooves of a micro heat pipe (ISRO, Rs.19.44 Lakhs)

49. Thermomechanically processed high strength bainitic steel rails for Indian Railways (TBR) (RDSO, Indian Railways, Rs.0.00 Lakhs)

50. Tuneable Meso Patterning of Polymer Bilayer Thin Films with Electric Field (ISIRD Grant of SRIC, IIT Kharagpur, Rs.5.00 Lakhs)

51. Upgradation of Coal Fines in a Column Flotation Cell (CSIR, New Delhi, Rs.3.71 Lakhs)

52. Water lubricated transport of high viscous oils - Experimentation and theory (DST, Rs.19.00 Lakhs)

Consultancy Projects

1. Antimicrobial Coatings On Plasma Modified Polymer Substrates (DRDO, Govt. of India, Rs.0.00 Lakhs)

2. Blast Protection System For Vehicle Glass Windows (Army Technical Board, Govt. of India, Rs.0.00 Lakhs)

3. Bond Work Index of Rampura Agucha Ore (Ramura Agucha Mines, HZL, Rajasthan, Rs.2.00 Lakhs)

4. Composite Development Center (RDSO, Rs.7.50 Lakhs)

5. Consultancy Input on Design and Hydrodynamics Studies of Micro Bubble Generator (M/s Tata Steel, Jamshedpur, Rs.0.00 Lakhs)

6. Consultancy services for implementation of APC in DCU and HCU (NRL Ltd, Rs.7.72 Lakhs)

7. Design and development of a mathematical model for ultra fast cooling of steel strips (DDMM) (Tata Steel, Jamshedpur, Rs.0.00 Lakhs)

8. Design of an Industrial Scale Hydrocyclone (DISH) (M/s Tata Steel, Jamshedpur, Rs.0.00 Lakhs)

9. Design of Bubble Column with External Bubble Generator (BCEB) (M/s Tata Steel, Jamshedpur, Rs.0.00 Lakhs)

10. Design verification and critical analysis of bag filters installed at sponge iron plant in Orissa (CABF) (Orissa State PCB, Rs.0.00 Lakhs)

11. Design Verification of Bag Filters installed at various Sponge Iron Plants in Orissa (State Pollution Control Board, Orissa, Bhubaneswar, Rs.0.00 Lakhs)

12. Development of gas sweetening technology for removal of co2 from natural gas (Engineers India Limited, Rs.30.00 Lakhs)

13. Development of Long Fiber Thermoplastic Composites (IIT Kharagpur, Rs.3.00 Lakhs)
14. Development of mixing model for alloy dissolution in steel ladles (MMAD) (Tata Steel, Jamshedpur, Rs.0.00 Lakhs)
15. Development of Natural fiber SMC (Continental Structural Plastics, Troy, MI, Rs.32.00 Lakhs)
16. Development Of Software For Design Of Two Phase Flow System With Simple Geometries (DSSG) (M/s Tata Steel, Jamshedpur, Rs.0.00 Lakhs)
17. Examination of STPP Manufacture at Haldia (M/s Tata Chemicals, Durgachak, Haldia, Rs.0.00 Lakhs)
18. Modeling for Upscaling the Capacity of Ceramic Membrane based Wastewater Treatment Unit (Central Glass & Ceramic Research Institute, Rs.5.91 Lakhs)
19. Modelling of a closed cycle boiler reactor (CCBR) (NSTL (DRDO) Vizag, Rs.9.92 Lakhs)
20. Modelling of Chocolate behavior during tempering and cooling process (CBTP) (Cadbury India Ltd, Thane, Rs.4.00 Lakhs)
21. Modelling of thermitic based closed cycle thermal system (CCTS) (HEMRL (DRDO), Pune, Rs.9.00 Lakhs)
22. Optimization, characterization and casting of haemodialysis membranes (Acropetal Pvt. Ltd, Rs.21.00 Lakhs)
23. Pelletization of Zeolite Synthesized from Lignite Fly Ash and Application of Zeolite Pellets in Treatment of Ground Water and Blowdown Water (Neyveli Lignite Corporation Ltd., Rs.28.67 Lakhs)
24. PERFORMANCE EVALUATION OF BAG FILTER SYSTEM(EABS) (M/S-AARTI STEEL LTD., Rs.0.00 Lakhs)
25. Process Simulation and Material Balance of Uran Plant (Oil and Natural Gas Commission, Rs.6.47 Lakhs)
26. Renewable resource/bio-based low density SMC development (Continental Structural Plastics, 755 West Big Beaver Road, Suite 700, Troy, MI 48084, USA, Rs.30.00 Lakhs)
27. Study and Modeling of Gas Processing Plant at Uran (ONGC, Rs.6.70 Lakhs)
28. Surface energy Modification of SMC substrates using RF Plasma (CSP Plastics, TROY, MICHIGAN, USA, Rs.6.00 Lakhs)
29. Survey of Biogas Plants in West-Bengal (West-Bengal Renewable Energy Agency, Rs.2.50 Lakhs)
30. Technical Support and guidance to Improve Quality of Lead Acid Battery ( QLAB) (M/S Bright Solar Ltd., Rs.0.00 Lakhs)
31. Testing & prototype manufacturing of composite products. (Various Organizations, Rs.5.00 Lakhs)
32. Training Programme on Pultrusion Technology with Introduction to other Fabrication Method. (Zoom Developers, Rs.0.60 Lakhs)
33. Verification of Bag Filter System at M/S Maithan Ispat Ltd. (M/S Maithan Ispat Ltd., Orissa, Rs.1.48 Lakhs)

**Patents (filed / granted)**

1. A Cheap and simple attachment to orient any object to desired direction accurately under microscope for efficient viewing and imaging.
2. A method for generation of meso scale surface patterns with different feature height in polymer films Coated on Planar and non planar Surfaces using a single stamp
3. A Novel Set up for Spinning Polymeric Hollow Fiber Membrane
4. A process for enzymatic hydrolysis of cellulosic biomass for bioethanol production
5. A process for ionic liquid based catalytic conversion of cellulose to fuel products
6. Clay Isocyanate nano dispersions and polyurethane nanocomposite produced there with.
7. Clays as cell openers in polyurethane foams
8. Creation of Complex micropatterns with flexible stamp
9. Design of a laterite based arsenic filter for domestic and community scale
10. Development of high capacity and cost effective arsenic adsorbent using modified laterite
11. Development of Vehicle Structure to Withstand Blast Loading
12. Electric field assisted membrane separation of pectin
13. Generation of Submicron to Macroscopic Patterns and Objects by Successive Miniaturization Using Shrinkable Materials and Articles Formed Thereby
14. Implantable Device having Antimicrobial coating and a method of Manufacturing the same
15. Membrane based water-extraction of polyphenols from green tea leaves
16. Micro and sub micro patterning of soft solids and articles formed thereby
Visits Abroad by Faculty Members

3. Chakraborty, Jayanta - AIChE Annual meeting (Pittsburgh, USA, ) 7 days
4. DasGupta, Sunando - Research (International Centre for Theoretical Physics (ICTP), Italy, ) May 15 - June 9 , 2012
5. Meikap, Bhim Charan - Chair a Sesssion of ICCE 2011 (ETH Zurich, Switzerland, ) September 11-15, 2011
6. Meikap, Bhim Charan - Chair a Session of IWA Conf. on Wastewater Purification and Reuse (TEI, Crete, Greece, ) March 28-30, 2012
10. Chakrabarty, Saikat - For research collaboration with Prof. Chris Somerville (Director, Energy Biosciences Institute, UCB) (University of California Berkeley, ) 1-7 July 2012

Invited Lectures by Faculty Members

1. Soft Patterning of Polymer Films by Mukherjee, Rabibrata (National Workshop on Soft Matter, Institute of Chemical Technology Mumbai)
2. Patternning of Polymer Films by Mukherjee, Rabibrata (Indo-US Workshop on Fabronics: Micro and Nano Scale Dynamics, BESUS)
3. Soft Nano Patternning of Polymer Films by Mukherjee, Rabibrata (QIP Short Term Course on Nanotechnology for electronic & photonic applications, Material Science Centre, IIT Kharagpur)
4. Soft Patterning of Polymer Thin Films: Some Recent Developments by Mukherjee, Rabibrata (Department of Chemical Engineering, IIT Guwahati)
5. Potential Applications of Soft Lithographically Patterned Surfaces in Biological Applications by Mukherjee, Rabibrata (Indo-US Workshop on Fabronics for Healthcare, CSIR – CMERI Durgapur)
6. Substrate surface energy effects in nanoparticle stabilized polymer thin films by Mukherjee, Rabibrata (Indian Science Congress, presented in Materials Science Section, Kolkata)
7. Pollution Control in Sponge Iron Plants by Meikap, Bhim Charan (NIT KArnataka)
8. Dust Emission Control by Meikap, Bhim Charan (Haldia Institute of Technology, HAlidia)
9. Tailor made membranes and their applications by De, Sirshendu (Materials Science IIT Kharagpur)
10. Development of low cost arsenic filter by De, Sirshendu (Deartment of Chemical Engg., IIT Bombay)
11. Modeling approaches of pressure driven membrane separation processes by De, Sirshendu (Deartment of Chemical Engg., IIT Bombay)
12. Polymeric membranes: Tailor-made casting and their applications by De, Sirshendu (Deartment of Chemical Engg., IIT Bombay)
14. Development of low cost arsenic filter by De, Sirshendu (Institute of Chemical Technology, Mumbai)
15. Modeling of pressure driven membrane separation processes by De, Sirshendu (Institute of Chemical Technology, Mumbai)
16. Casting and spinning of polymeric membranes and their applications by De, Sirshendu (Institute of Chemical Technology, Mumbai)
17. Synthesis and traits of an Engineering Doctoral Thesis: A tutorial by De, Sirshendu (Dept Chemical Engg., IIT Kharagpur)
18. Indigenous technology for membrane casting, spinning and arsenic removal by De, Sirshendu (KIIT, Bhubaneswar)
19. Technology innovations: Membrane casting, applications and arsenic removal from groundwater by De, Sirshendu (Deartment of Chemical Engg., IIT Kanpur)
20. Fluoride removal by cellulose acetate-alumina mixed matrix membrane by De, Sirshendu (NGRI, Hyderabad)
21. Innovative technology for membrane casting, applications and arsenic removal by De, Sirshendu (IICT Hyderabad)
22. Membrane synthesis, application and novel technology for arsenic removal by De, Sirshendu (Materials Science IIT Kharagpur)
23. Polymeric membrane casting and applications by De, Sirshendu (CGCRI, Kolkata)
24. Low cost laterite based arsenic filter at community scale by De, Sirshendu (UNICEF, Kolkata)
25. Functional polymeric membranes and their applications by De, Sirshendu (Indian Science Congress, Kolkata)
26. Casting and spinning of polymeric membranes with applications and laterite based arsenic filter by De, Sirshendu (NIST, Behrampur)
27. Rajiv Gandhi Institute of Technology, Kottayam, Kerala by De, Sirshendu (Functional membranes and their applications)
28. Casting of polymeric membranes and their applications by De, Sirshendu (VNIT, Nagpur)
29. Treatment of textile and tannery effluent using membrane separation processes by De, Sirshendu (College of Engg, Kolkaghat)
30. Casting and spinning of polymeric membranes and their applications by De, Sirshendu (IISC, Bangalore)
31. Mixing Effects in Cellulosic Fuel Production by Chakrabarty, Saikat (University of California Berkeley)
32. Optimally mixed reactors for Cellulosic Fuel Production by Chakrabarty, Saikat (Joint Bioenergy Institute, California)

Books Published


Papers Published in Journals

1. A combined complete pore blocking and cake filtration model for steady state electric field assisted ultrafiltration By B. Sarkar and S. De AIChE J 58 (5), 1453-1446 (2012)


24. Clarification of stevia extract by ultrafiltration: Selection criteria of the membrane and effects of operating conditions By Chhaya, S. Mondal, G. C. Majumdar and S. De Food and Bioproduct Processing 90, 525-532 (2012)


33. Effect of grafting on nanoparticle segregation in polymer/nanoparticle blends near a substrate By Venkat Padmanabhan Journal of Chemical Physics 137 (9), 094907 (2012)


37. Experimental and kinetic modeling of As(V) and As(III) adsorption on treated laterite using synthetic and contaminated groundwater: Effects of phosphate, silicate and carbonate ions By Abhijit Maiti, Jayanta Kumar Basu and Sirshendu De Chem. Eng. J. 191, 1– 12 (2012)


44. Generation of uniform small bubbles and hydrodynamic characterization of a bubble column with high pressure jet sparger By S. Lahore, S. Chakraborty, B. C. Meikap Korean Journal of Chemical Engineering, Springer 29 (6), pp 724-730 (2012)


46. Identification of fouling mechanism during ultrafiltration of stevia extract By S. Mondal, Chhaya, S. De Food and Bioprocess Technology 6, 931-940 (2013)

47. Identification of surfactant additives for modification of crystal morphology: the significance of the threshold concentration. By Nitish Singh, Ribani Yeri and Jayanta Chakraborty Industrial and engineering chemistry research Submitted (2013)


78. Sherwood number in flow through parallel porous plates (microchannel) due to pressure and electroosmotic flow By N. Vennela, S. Mondal, S. Bhattacharjee and S. De AIChE J 58 (6), 1693-1703 (2012)


Papers Presented in Conferences


**Department of Chemistry**

**Head**
Prof. Dipak Ranjan Mal

**Professors**

- **Bandyopadhyay, Sanjoy**  
  **Ph.D. (IISc Bangalore)**, Protein folding, Theoretical and Computational Chemistry, Hydration properties of bio-molecules, Self-assembled molecular films at interfaces, Protein-ligand complexes, Phospholipid membranes, Cyclodextrin-guest interaction

- **Basak, Amit**  
  **Ph.D. (Cal), D.Phil. (Oxon)**, Bioorganic/Medicinal Chemistry/Selective protein capture/Synthetic Chemistry

- **Bhattacharjee, Manish**  
  **Ph.D. (NEHU)**, Catalysis, Synthetic Inorganic Chemistry

- **Chattaraj, Pratim Kumar**  
  **Ph.D. (IIT Bombay)**, Density functional theory, Chemical reactivity, ab initio calculations, Quantum chaos, Aromaticity in metal clusters

- **Dasgupta, Swagata**  
  **Ph.D. (RPI New York)**, Protein-protein and Protein-small molecule interactions

- **Dey, Joykrishna**  
  **Ph.D. (Kanpur)**, Molecular Self-assembly, Colloidal Drug Delivery Systems, Polymer-Surfactant Interactions, Organogels and Hydrogels of Low-Molecular-Weight Amphiphiles

- **Hajra, Saumen**  
  **Ph.D. (Pune Univ)**, Catalytic Asymmetric Reactions, Organocatalysis, Total Synthesis of Biologically Active Compounds

- **Mal, Dipak Ranjan**  
  **Ph.D. (Missouri)**, Benzannulation and Hauser annulation, Lateral lithiation Michael-initiated ring closure, Total synthesis of bioactive natural products: angucyclines anthracyclines carbazoles quinonoids, Oxidative dearomatization

- **Pal, Tarasankar**  
  **Ph.D. (Burdwan Univ.), D.Sc. (Visva Bharati Uni)**

- **Pathak, Tanmaya**  

- **Pramanik, P**  
  **Ph.D. (IIT Kharagpur)**, Nanoscience and Nanotechnology, Material Chemistry

- **Ray, Debashis**  

- **Ray, Jayanta Kumar**  
  **Ph.D. (Calcutta Univ)**, Synthetic Organic Chemistry

- **Sarkar, Nilmoni**  
  **Ph.D. (Jadavpur Univ)**, Characterization of Ionic Liquid containing Microemulsion, Photoinduced electron transfer in RTIL and RTIL containing confined media., Photophysics and Photodynamics of biologically relevant molecules, Excited state intramolecular proton transfer in organized assemblies, Characterization of surface active ionic liquids

- **Sarkar, Tarun Kumar**  
  **Ph.D. (Calcutta Univ)**, Synthetic Organic and Organometallic Chemistry

- **Srivastava, Suneel Kumar**  
  **Ph.D. (IIT Kharagpur)**, Inorganic material and polymer nanocomposites

- **Taraphder, Srabani**  
  **Ph.D. (IISc Bangalore)**, Theoretical Physical Chemistry, Computer Simulation of Charge Transfer Processes
**Associate Professors**

Biradha, Kumar  
*Ph.D. (Hyderabad)*, Gas sorption studies, Supramolecular Chemistry, Crystal Engineering, Polymorphism, Coordination Polymers, Structural Chemistry, Solid state reactions, Soft materials

Mahanty (Pathak), Amita  
*Ph.D. (IIT Kharagpur)*, Synthesis and Characterization of Inorganic Nanomaterials

Nanda, Samik  
*Ph.D. (IICT-Hyderabad)*, Asymmetric synthesis, Biocatalysis, Total synthesis of natural products

Raj, C Retna  
*Ph.D. (M.K Univ Madurai)*, Optical and electrochemical sensors, Electrocatalysis and fuel cell, Inorganic multifunctional nanomaterials, Energy conversion and storage devices

**Assistant Professors**

Ayyappan, Anoop  
*Ph.D. (Univ. of Hyderabad)*, Computational Chemistry, Reaction Mechanisms, QM/MM studies of biological systems, Computational Photochemistry

Dhara, Dibakar  
*Ph.D. (Osmania Univ. Hyderabad)*, Synthetic Polymer Chemistry, Colloids and Nanomaterials, Block Copolymers and Gels, Physical Chemistry of Macromolecules

Halder, Mintu  
*Ph.D. (IACS Kolkata)*, Experimental Physical Chemistry, Biophysics, Photophysics of Nano-materials, Spectroscopy

Mani, Ganesan  
, Anion Receptors, Organometallic Chemistry

Mishra, Sabyashachi  
*Ph.D. (Tech. Univ., Munich, Germany)*, Theory of Relativistic Vibronic Coupling in Molecular Physics, Relativistic Quantum Chemistry, Molecular Structure and Spectroscopy in Excited States, Reactive Processes in Biology, Network Dynamics in Bio-(chemical/physical) processes

Nag, Ahindra  
*Ph.D. (Jadavpur Univ)*, Seventy papers published, Natural Product Enantioselective synthesis of compounds

Patra, Sanjib Kumar  

Rajakumar Ananthakrishnan  

Singh, N D Pradeep  

**Faculty Appointments**

Sanjib K Patra  
Assistant Professor

**Faculty Retirement**

T K Sarkar  
Professor

**Faculty Re-employment**

T K Sarkar  
Professor
**Brief Description of on-going activities**

The department is actively pursuing research embracing both basic and applied aspects of chemistry. Currently, the department is handling over 40 sponsored projects from various agencies. The department is equipped with various sophisticated instruments: Bruker APEX SMART CCD Single Crystal diffractometer, Bruker AVANCE II 400 MHz and AVANCE II 200 MHz spectrometer, Shimadzu DT-40 model 883 IR Spectrometer, PW-17291710 X-Ray Diffractometer, Cyclic Voltammetric Model P9001, Chrompacs Gas Chromatograph and JASCO DIP 370 digital polarimeter, Spex Fluorolog 3 fluorimeter, and a Perkin Elmer C, H, N Analyzer. Active research in synthetic chemistry is underway on the design and synthesis of novel enediyynes as DNA cleaving agents, on the total synthesis of bioactive natural products such as anthracyclines, angucyclines, furocoumarins, indole alkaloids, furoterpenes, lactams and heterocyclic quinonoids. Enzyme mediated synthesis and a substrate analog approach to determine the active site of enzymes is being studied as is the enzyme inhibition approach to drug design. Isolation and characterization of an angiogenic protein is in progress with an aim to determine the specificity by studying several dinucleotide substrates. Supramolecular chemistry relating to thia azarenes and redox switchable receptors is in progress. Development of highly selective and green methodologies based on organometallic, radical and chiron approaches. In the area of catalysis, micellar, zeolite, and bimetallic catalysts are being developed. Early transition metal based catalysts for aqueous medium polymerization and cationic ruthenium complexes as catalysts for various organic transformations. Synthesis of advanced functional materials for fuel cell application. Electro catalyst for oxygen reduction and methanol oxidation. Development integrated biosensing platform clinical and environmental applications. In the field of Bioinorganic chemistry, research is being pursued on electron transfer processes with emphasis in dioxygen chemistry. Active research is also underway in the areas of crystal engineering and electroanalytical chemistry. Notable research on various aspects of nanochemistry involve development of metal nanoparticles, nanocrystalline ferrites, ceramics and composites. Materials for high temperature and superconducting applications and solar energy conversion is also underway. Catalysis involving photoactivation techniques and micelle stabilized nanoparticles are currently being investigated to solve environmental pollution related problems. Colloidal systems, especially vesicles formed by chiral surfactants and their potential applications in i.v drug delivery are being studied. Active research is also being carried out on the development of hydrogels and organogels for applications in transdermal drug delivery. Investigation of solution properties of a number of polymers using a variety of tools is in progress. Studies are also being conducted on the aggregation behavior of polyelectrolytes and block copolymers in aqueous media. Capillary electrophoresis is being employed for the chiral separation of drugs. Photophysical studies of different organic molecules in pure solution and organized assemblies are being investigated using fluorescence spectroscopy. Theoretical physical chemistry in the department includes studies relating to density functional theory, chemical reactivity, ab initio calculations, quantum chaos; chemical reaction dynamics in liquids and biological macromolecules, molecular modeling and computer simulation studies of complex biological systems such as: membranes, proteins etc. Protein structure analysis on the loop regions in proteins is also underway.

**Thrust Areas**

1. Biomimics; Transition Metal Cluster Complexes; Structural Coordination Chemistry; Ferromagnetic Metal Complexes; Drug Design; Chemical and Electrochemical Sensors; Molecular Modeling; Protein Folding & Enzymatic Catalysis; Spectroscopy of Assemblies; Green Chemistry; Nanochemistry; Catalysis.

**Lectures by Visiting Experts**

1. Application of Biocatalysis in organic synthesis by Dr. Anju Chadha (IIT-Madras)
2. Development of New Synthetic Methods en route to Some Glycosidase Inhibitors by Prof. Y. D. Vankar (Dept. of Chemistry, IIT-Kanpur)
3. NHC-Organocatalysis in Novel C-C and C-Heteroatom Bond-forming Reactions by Dr. G. Vijay Nair (NIIST-Trivandrum)
4. Mechanotransduction through force-modulated ligand binding affinity by Dr. Sudipta Samanta (MIT, Cambridge, Massachusetts, USA)
5. Stereoselective synthesis of bioactive aza-, carbo- and oxacyclic compounds via enolate anions and dianions by Prof. Manas Ghorai (Dept. of Chemistry, IIT-Kanpur)

6. Understanding and Interfering with the Conformational Transitions of the Full-Length Amyloid-b Monomer: Insights from Computer Simulations by Dr. Neelanjana Sengupta (Physical Chemistry Divn, NCL Pune)

7. From Peptidomimetics to Proteins: Conformational Analysis of Peptides and Profiling of Aldehyde Decarbonylase by Dr. Bishwajit Paul (University of Michigan, Department of Chemistry)

8. Functionalized Nanomaterials for Supramolecular Application by Dr. Mrinmoy De (Northwestern University)

9. Synthetic Approaches to the Architecturally Interesting Indole Based Alkaloids via Intramolecular-Dehydrogenative-Coupling (IDC) by Dr. Alakesh Bisai (IISER-Bhopal)

10. Contemporary developments in nonadiabatic chemical dynamics by Prof. Susanta Mahapatra (University of Hyderabad)

11. Functionalized microporous and mesoporous materials for high CO2 uptake by Prof. Asim Bhowmick (IACS-Kolkata)

12. Energetics of charge transport processes in trans-membrane proteins: A molecular perspective by Dr. Suman Chakraborty (NCL, Pune)

13. Computational Investigations into Small Molecule Activation by Dr. Kumar Vanka (NCL, Pune)

14. Microparticles and Micropumps: A Chemical Approach for Designing Microscale Container/Devices by Dr. Debabrata Patra (Pennsylvania State University, USA)

15. Synthetic Studies of Macrolides and Their Analogues by Dr. P. Srivani (IIT-Hyderabad)

16. Study of C-X (X= H, O, F, S) Bond Activation by Ir and Pt Complexes and Related Chemistry by Dr. Sabuj Kundu (Dept. of Chemistry, University of North Carolina, USA)

17. Chemical Biology: applying chemistry to biological questions by Dr. Devraj Subramanian

18. Development of fluorogenic bio-application based on supramolecular interactions by Dr. Kalyan K. Sadhu (Institut de Science et d’Ingénierie Supramoléculaires, Université de Strasbourg, France)

19. Application of Self-Assembly Strategies in Artificial Photosynthesis by Dr. Kingsuk Mahata (Institut für Organische Chemie, Universität Würzburg, Am Hubland, 97074 Würzburg, Germany)

20. From Peptidomimetics to Transition Metal Catalysis by Dr. Prantik Maity


22. Cellular targets of Guanidino phthalocyanines by Dr. BYR Vummidi (University of Zurich, Switzerland)

23. Programming Stereochemistry at all Carbons of Cyclohexane Rings: Total Synthesis of Structurally Complex Alkaloids by Prof. G. Pandey (NCL-Pune)

24. Effect of Azobenzene Isomerisation on DNA Stability by Dr. Mithun Biswas (Institut für Physikalische u. Theoretische Chemie, Goethe-Universität, Max-von-Laue-Str. 7)

25. New Approaches to Asymmetric Nucleophilic Catalysis and the Development of Redox-Neutral Reaction Cascades by Dr. Chandra Kanta De (Michigan Max-Planck-Institut für Kohlenforschung, Germany)

**Doctoral and MS Degrees Awarded**

1. Mohammed Ikbal 08CY9709 : Newly Developed Nonionic Photoacid Generators and Their Applications(Ph.D.)


4. Atanu Singha Roy 08CY9724 : Interactions of dietary polyphenols and their copper complexes with serum albumins: Effects of glycation and binding with DNA(Ph.D.)


7. Nilanjana Chowdhury 08CY9708 : Design and Development of Small Organic Molecules as Photoinduced DNA Cleaving Agents(Ph.D.)
8. Raju Karmakar 07CY9725 : Total synthesis of chlorocyclinone A, the first PPAR-gamma antagonist of natural origin; unfolding of a Prins reaction, and synthesis of pestacin methyl ethers(Ph.D.)
10. Priyanka Bolel 07CY9719 : Studies on Electrostatic Interaction of Food Dyes with Serum Albumins and Small Molecular Assemblies(Ph.D.)
11. Nandan Jana 08CY9702 : Synthetic Studies Towards Resorcylic Acid Lactones (RALs) and Stagonolides(Ph.D.)
12. Biswajit Panda 07CY9706 : Catalysis by Gold Alone and in Combination with Palladium: Methodology Developments and Total Synthesis of Natural Products(Ph.D.)
13. Ramkinkar Santra 07CY9709 : Crystal Engineering Studies towards Template Directed Solid State Photodimerization of Olefins and Host-Guest Chemistry(Ph.D.)
15. Ashok Kumar Das 07CY9711 : Chemical and electrochemical synthesis of Au nanoparticles and their electroanalytical applications(Ph.D.)
16. Suman Samai 07CY9715 : Supramolecular Materials Based on Hydrogen Bonding and Coordination Bonding: Cocrysats, Coordination Polymers and Gels(Ph.D.)
17. Arnab Kumar Maity 08CY9712 : Electrophilic Activation across a Multimetallic Piano-Stool Indium-Tin Catalyst: Synthetic and Mechanistic Studies(Ph.D.)
18. Tapas Guchhait 08CY9713 : Dipyrrrolyl- and Tripyrrolylmethane Based Macrocyclic, Macrocyclic and Acyclic Receptors for Anions(Ph.D.)
19. -Dicarbonyl and Related Reagents: Synthesis of C-Nucleosides, Densely Functionalized Carbocycles and Complex Polyheterocyclic Scaffolds(Ph.D.); Chinmoy Manna 08CY9703 : Functionalization of Carbohydrates with

**Member - Professional Bodies**

1. Mahanty (Pathak), Amita, *Member* - Asian Nanoscience and Nanotechnology Association (ANNA) and Academy of Nanoscience and Nanotechnology (ANN)
2. Bandyopadhyay, Sanjoy, *Life Member* - Chemical Research Society of India
3. Raj, C Retna, *Member* - Electrochemical Society
4. Raj, C Retna, *Life Member* - Chemical Research Society of India
5. Raj, C Retna, *Life Member* - Indian Society of Electroanalytical Chemistry
6. Rajakumar Ananthakrishnan, *Life Member* - Society of Environmental Chemistry and Allied Sciences (SECAS)
7. Rajakumar Ananthakrishnan, *Life Member* - Materials Research Society of India (MRSI)
8. Dhara, Dibakar, *Life Member* - Society of Polymer Science, India
10. Patra, Sanjib Kumar, *Life member* - Chemical Research Society of India
11. Patra, Sanjib Kumar, *Member* - Canadian Society of Chemistry
12. Patra, Sanjib Kumar, *Member* - American Chemical Society
13. Sarkar, Tarun Kumar, *Life member* - CRSI
15. Srivastava, Sunee Kuar, *Life member* - Academy of Microscopic Science and Technology
16. Srivastava, Sunee Kuar, *Life member* - Society for Polymer Science, India
17. Mal, Dipak Ranjan, *Life member* - Indian Chemical Society
18. Mal, Dipak Ranjan, *Member* - American Chemical Society
19. Mal, Dipak Ranjan, *Life member* - Chemical Research Society of India
23. Chattaraj, Pratim Kumar, Member: Nomination Panel - Tetrahedron Young Investigator Award, Elsevier
24. Ray, Debasish, Life Member - Indian Chemical Society, Kolkata.
25. Ray, Debasish, Life Member - Indian Association for the Cultivation of Science, Kolkata.
26. Ray, Debasish, Life Member - Chemical Research Society of India (CSRI), Bangalore
27. Dasgupta, Swagata, Member 2010 - National Screening Committee for Fulbright-Nehru Doctoral and Professional Research Fellowships
28. Dasgupta, Swagata, Life Member - Chemical Research Society of India
29. Taraphder, Srabani, Life Member - Indian Chemical Society, Kolkata.
30. Ray, Debashis, Life Member - Indian Association for the Cultivation of Science, Kolkata.
31. Ray, Debashis, Life Member - Chemical Research Society of India (CSRI), Bangalore
32. Ray, Debashis, Life Member - Chemical Research Society of India
33. Dey, Joykrishna, Life Member - Indian Association for the Cultivation of Science
34. Dey, Joykrishna, Life Member - Chemical Research Society of India
35. Sarkar, Nilmoni, life member - Indian Association for the Cultivation of Science
36. Sarkar, Nilmoni, life member - Chemical Research Society of India

**Member - Editorial Board**

1. Bandyopadhyay, Sanjoy (0) Editorial Board member - Mediterranean Journal of Chemistry
2. Bandyopadhyay, Sanjoy (0) Editorial Board member - Philisophic Nature
11. Dasgupta, Swagata (0) Editorial Board Member - Protein and Peptide Letters
12. Dasgupta, Swagata (0) Reviewer - PROTEINS: Structure, Function and Bioinformatics
13. Dasgupta, Swagata (0) Reviewer - Journal of Molecular Structure
18. Rajakumar Ananthakrishnan (2011) Member of Editorial Advisory Board - International Journal of Environmental Sciences
21. Srivastava, Suneel Kumar (0) Editorial Advisory Board Member - Recent Patents on Nanotechnology
22. Srivastava, Suneel Kumar (0) Associate Editor - Nanoscience and Nanotechnology Letters
23. Srivastava, Suneel Kumar (0) Editor - Journal of Nano Energy and Power Research

**Awards & Honours**

3. Raj, C Retna (2013) CRSI Bronze Medal
5. Chattaraj, Pratim Kumar (2013) Highest Citation Award (on the papers published in one year), IIT Kharagpur
6. Mishra, Sabyashachi (2012) INSPIRE Faculty award of DST India
Sponsored Research Projects

1. A step towards the utilization of D-fructose, L-sorbose and 1,5-anhydro-D-fructose as chiral pools in synthetic chemistry. (CSIR, New Delhi, Rs.23.00 Lakhs)
2. A Value Chain on Aloe Vera Processing (ICAR, NAIP, Rs.385.00 Lakhs)
3. Application of high resolution NMR spectroscopy in complex chemical and biochemical systems (DST, Rs.205.00 Lakhs)
4. Artificial Protein cleaving agents (CSIR, Rs.16.00 Lakhs)
5. Asymmetric Syntheses of γ-Butyrolactone Natural Products (CSIR, New Delhi, Rs.26.28 Lakhs)
6. Theoretical Modelling of the Role of Hydration in Proton Transfer Processes in Proteins (CSIR, Rs.8.39 Lakhs)
7. CATALYTIC HYDROLYSIS BY A MICROBIAL ENZYME WITH POTENTIAL OF AN ANTIBIOTIC TARGET (DST India, Rs.73.00 Lakhs)
8. Characterization of Ionic Liquid containing microheterogeneous media and investigation of ultrafast processes in these confined media (CSIR, Rs.19.67 Lakhs)
9. Computational studies of gold catalyzed cycloaddition reactionos (ISIRD, Rs.5.00 Lakhs)
10. COOPERATIVITY IN LIGAND MIGRATION IN A DIMERIC MICROBIAL HEMOGLOBIN (ISIRD, SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
11. Crystal Engineering Studies on Derivatives Containing 2° Amide and Pyridine Functional Groups: Design and Applications (CSIR, Rs.11.00 Lakhs)
12. Cyclic and Acyclic Vinyl Sulfones Constructed on Chiral Appendages: Reactive Carbohydrates as Versatile Intermediates for Accessing Chirally Pure Hete (DST, Rs.24.00 Lakhs)
13. Design of Organic-Inorganic Hybrid Materials and Exploration of their Gas Adsorption and Disorption Properties (DST, Rs.49.00 Lakhs)
14. Design of Organic-Inorganic Hybrid Materials with Porous and/or Chiral Properties (DST, Rs.18.72 Lakhs)
15. Development and applications of polyolefin and polyolefinic rubber /hybrid filler nanocomposites (CSIR, Rs.17.92 Lakhs)
16. Development of Polypyrrole/Disinfectant Nanocomposites for Effective Purification of Water (DRDO, Rs.5.16 Lakhs)
17. Development of Silicon Carbide supported Graphene-Polymer Nanocomposites for EMI Shielding Applications (DRDO, Rs.47.79 Lakhs)
18. Droplet based screening of amyloid beta peptide aggregation (DBT, Rs.49.50 Lakhs)
19. Epoxy reinforced inorganic material filled organic polymer composites in tribological applications (DRDO, Rs.24.56 Lakhs)
20. Evaluation of Potential Applications in Drug Delivery of Some Novel pH-Responsive, Biocompatible, and Biodegradable Hydrophobically Modified Polyme (DST, Rs.205.00 Lakhs)
21. Fatty Acid Biosynthesis Inhibitors (DBT, Rs.70.00 Lakhs)
22. Garratt Braverman Rearrangemnet (DST, Rs.37.00 Lakhs)
23. Generation and Application of Photoaddressed surfaces (DST, Rs.50.00 Lakhs)
24. Gold catalyzed organic transformations: Applications to the synthesis of bioactive natural products (DST, Rs.29.16 Lakhs)
25. Hydroxymethylated cycloalkenones privileged small molecular chiral templates for asymmetric synthesis of bio-active natural products (DST, Rs.35.00 Lakhs)
26. Hydroxynitrile lyase biocatalysis: production of active pharmaceutical intermediates by substrate engineering (DBT, New-Delhi, Rs.20.00 Lakhs)
27. HYPOMAP new materials for hydrogen powered mobile applications (DST, Indo-Eu, New Delhi, Rs. 47.12 Lakhs: IIT KGP Share, Rs.47.12 Lakhs, Rs.47.12 Lakhs)
28. Identification of potential biomarkers for the diagnosis of endometriosis: a proteomics approach (DST, Rs.25.20 Lakhs)
29. Investigations on development and properties of poly- olefinic elastomer nanocomposites (CSIR, Rs.13.50 Lakhs)
30. MULTIFUNCTIONAL MATERIALS FOR ELECTROCHEMICAL ENERGY CONVERSION AND STORAGE DEVICES (DST, Rs.46.75 Lakhs)
31. New Functional group photolithography methods to pattern self assembled monolayers (SAM's) (DST, Rs.17.00 Lakhs)
32. New photoremovable protecting groups for self assembled monolayers (SAM's) (ISIRD, SRIC, Rs.5.00 Lakhs)
33. Olefin polymerization by organolanthanide catalysts (CSIR, New Delhi, Rs.15.70 Lakhs)
34. Organocatalytic and Enantioselective 1,2-Halofunctionalization of Alkenes (Department of Science & Technology (DST), New Delhi, Rs.23.90 Lakhs)
35. PHOTOELECTROCHEMICAL SENSORS BASED ON FUNCTIONAL MATERIALS (CSIR, Rs.22.28 Lakhs)
36. Pi-pi interactions in cyclization reactions (DST, Rs.21.00 Lakhs)
37. Role of water in predicting the protein folding-unfolding pathways: Computer simulation studies (Department of Science and Technology, Rs.26.65 Lakhs)
38. Sesqui and Di Terpenoids by Palladacycles (DST, Rs.25.00 Lakhs)
39. Sir. J. C. Bose Fellowship (DST, New Delhi, Rs.68.00 Lakhs)
40. Studies on Palladium Catalysed Heck Reactions (CSIR, Rs.15.00 Lakhs)
41. Studies on Protein-Metal Colloid Interactions by Raman Spectroscopy (DST (Co-PI), Rs.20.96 Lakhs)
42. Studies on Sonophotocatalytic Degradation of Persistent Organic Pollutants (POPs) in Aqueous System (SERB (DST), Rs.26.90 Lakhs)
43. Study of the behaviour of Oil Spill on Ocean surface through laboratory experiments, modeling and Satellite Images (MOES, Govt. of India, Rs.78.00 Lakhs)
44. Synthesis and Characterization of Functional Organometallic Polymers (ISIRD, SRIC, IIT-KGP, Rs.0.00 Lakhs)
45. Synthesis and Characterization of Main-Chain Metal-Containing Conjugated Functional Polymers for Application in Alternative Energy Source (DST, Rs.23.00 Lakhs)
46. Synthesis and structural characterization of organolanthanide complexes and their applications (DST, New Delhi, Rs.39.40 Lakhs)
47. Synthesis of Inorganic Fullerene-type MoS2 and WS2 Nanoparticles and Study of their Lubrication Properties (ISIRD, IIT Kharagpur, Rs.4.15 Lakhs)
48. Synthetic studies towards small ring macrolides (CSIR, Rs.16.00 Lakhs)
49. Total synthesis of chlorocyclinones PPAR antagonists of natural origin (CSIR, New Delhi, Rs.18.00 Lakhs)
50. Total synthesis of mayamycin, an angucyline C-glycoside (DST, New Delhi, Rs.51.00 Lakhs)
51. Trivalent and divalent lanthanide complexes bearing macro-cyclic ligands for activation of CO2 and catalyse (DST, Rs.40.00 Lakhs)

Consultancy Projects

1. Asymmetric Synthesis of Novel Heterocarbocycles (TCG LifeSceineces: Chembiotek, Saltlake, Kolkata, Rs.6.61 Lakhs)

Patents (filed / granted)

1. Metal nanoparticle based sensors for hydrogen peroxide, uric acid and cholesterol and the preparation thereof
2. Polyunsaturated fatty acids from animal visera
3. Pyrrole-based Diphosphines and their Oxidized Products
4. Ultra-sensitive simultaneous electrochemical determination of arsenic, mercury and copper

Visits Abroad by Faculty Members

1. Chattaraj, Pratim Kumar - Inv. Speaker, International congress, TACC 2012 (Theory and application of computational chemistry) (Pavia, Italy, ) 2-7, September 2012
2. Biradha, Kumar - Visting Scientist (University of South Florida, USA, ) 23-05-2012 to 09-06-2012
5. Ayyappan, Anoop - Visiting Professor (Univeristy of Muenster, ) 5 weeks
Invited Lectures by Faculty Members

1. substrate binding and cleavage by beta-secretase by Mishra, Sabyashachi (IIT Guwahati (Theoretical Chemistry Symposium))
2. Amino acid based hydrophobically modified polyelectrolytes: Self-aggregation, Drug Solubilization, a by Dey, Joykrishna (Hyderabad)
3. Hydrophobically modified amphiphilic copolymers for encapsulation and sustained released of camptoth by Dey, Joykrishna (IIT Guwahati)
4. Design, Synthesis, and In vitro Evaluation of PEG Based Amphiphilic Copolymers as Nanocarriers for by Dey, Joykrishna (Vidyasagar University)
5. Nanomedicine: General Concept by Dey, Joykrishna (SVRM College, Guntur, AP)
6. CRSI Bornze Medal Lecture: A journey to explore the electrochemical applications...materials by Raj, C Retna (BHU Varanasi)
7. In search of ideal cathodcatalyst for direct methanol fuel cell by Raj, C Retna (BHU Varanasi)
8. Functional nanomaterials for sustainable energy conversion by Raj, C Retna (Hyderabad, ELAC 2013)
9. The art of biosensing with functional nanomaterials by Raj, C Retna (CLRI, Chennai)
10. Noble metal nanostructure: A versatile tool for bio and environmental analysis by Raj, C Retna (Pondicherry University)
11. Introduction to Computational Chemistry by Ayyappan, Anoop (Normala College, Muvattupuzha, Kerala)
12. Introduction to Computational Chemistry by Ayyappan, Anoop (Sir Syed College, Thaliparamba, Kerala)
13. Survey of Computational Chemistry Methods by Ayyappan, Anoop (College of Engineering Kannur, Kerala)
14. Unfolding and Proton Transfer Paths in a Thermally Unstable Mutant of Human Carbonic Anhydrase II by Taraphder, Srabani (Theretical Chemistry Symposium, IIT Guwahati)
16. Recent Developments in Quantum Chemistry by Chattaraj, Pratim Kumar (Santiago, Chile)
17. ACS Meeting onTheory and Simulation in Energy and Fuel Production and Utilization by Chattaraj, Pratim Kumar (Philadelphia, PA, USA)
18. Theory and application of computational chemistry by Chattaraj, Pratim Kumar (Pavia, Italy)
19. BITs 2nd New Energy Forum (NEF-2012) by Chattaraj, Pratim Kumar (Guangzhou, Guangdong Province, China)
20. Electronic Structure Approaches to Atoms, Molecules, Clusters and Solids by Chattaraj, Pratim Kumar (University of Hyderabad, Hyderabad, India)
21. New Emerging Trends in Chemistry by Chattaraj, Pratim Kumar (The IIS University, Jaipur)
22. INSPIRE Internship Program sponsored by DST, Govt. of India by Chattaraj, Pratim Kumar (School of Biotechnology, IIT University, Bhubaneswar, India)
23. Recent Developments in Chemistry (Sponsored by three National Science Academies) by Chattaraj, Pratim Kumar (Visva-Bharati, Santiniketan, India)
24. 3rd DAE-BRNS Symposium on Atomic, Molecular and Optical Physics by Chattaraj, Pratim Kumar (IISER Kolkata, India)
25. Mapping the Materials Genome at the Center for Informatics and the School of Natural Sciences by Chattaraj, Pratim Kumar (Shiv Nadar University (SNU), Delhi, India)
26. INSA Lecture (100 Lectures by INSA Fellows) by Chattaraj, Pratim Kumar (North Bengal University, India)
27. Frontiers in Chemical Sciences-2013 by Chattaraj, Pratim Kumar (Vidyasagar University, Midnapore, India)
28. Hydrogen Bonded Coordination Polymers and Gels: Guest, Anion, and Cation Exchange Dynamics by Biradha, Kumar (GRC, Waterville Valley, New Hampshire, USA)
29. Crystal Engineering of Functional materials by Biradha, Kumar (ACS on Campus at IACS, Kolkata)
30. Chemoenzymatic synthesis of small ring carbocycles from α-substituted β-oxoesters by Nanda, Samik (Agra for NOST 2012 meeting)

31. Synthetic studies towards resorcyclic acid lactones (RALs) by Nanda, Samik (IIT, Guwahati, NFCS symposium)

32. Scaffold oriented synthesis (SOS), a new strategy for accessing natural products and new chemotypes by Nanda, Samik (Dehradun, 78th Annual meeting of IAS)

33. Analytical Challenges in Unraveling the Environmental Proxies from the Antarctic Ice Samples by Rajakumar Ananthakrishnan (CECRI, Karaikudi)

34. Recent Trends in the Visible Light Assisted Photocatalysis for Environmental by Rajakumar Ananthakrishnan (CECRI (CSIR Laboratory), Karaikudi)

35. Palladium mediated transformations by Ray, Jayanta Kumar (International Symposium on Adv Chemistry)

36. Palladium mediated Cyclization and C-H activation by Ray, Jayanta Kumar (KIIT Bhubaneswar)

37. A Journey to the Centre of Ribonucleases by Pathak, Tanmaya (Jadavpur University (National Seminar on Recent Advances in Chemistry))

38. A Journey to the World of Modified Carbohydrates and Nucleosides by Pathak, Tanmaya (National Institute of Technical Teachers’ Training and Research, Bhopal, Madhya Pradesh)

39. Molecules to Medicine by Pathak, Tanmaya (Two Day National Level Seminar on “Chemistry-from the Past to the Future” at Dumdum Motijhil College, Kolkata)

40. Medicinal Chemistry: An Overview by Pathak, Tanmaya (North Bengal University, West Bengal (organised by the Indian Academy of Sciences, Bangalore))

41. Click Chemistry by Pathak, Tanmaya (North Bengal University, West Bengal (organised by the Indian Academy of Sciences, Bangalore))

42. Organocatalysis with and for the natural products by Mal, Dipak Ranjan (Contai P. K. College)

Papers Published in Journals


23. Aqueous route for the synthesis of magnetite nanoparticles under atmospheric air: functionalization of surface with fluorescence marker By Nagaprasad Puvvada, Dhrutabrata Mandal, Pravas Kumar Panigrahi and Amita Pathak Toxicology Research Vol 1, pp 196 (2012)


31. Book Review of The Importance of Pi-Interactions in Crystal Engineering By Kumar Biradha 

32. Bromine-mediated cyclization of 1,4-diaryl buta-1,3-diyne to 1,2,3-tribromo-4-aryl naphthalene By Raju Singh, Sukla Nandi, Jayanta K. Ray* 

33. Bromodimethylsulfonium bromide as a potential candidate for photocatalytic selective oxidation of benzylic alcohols using oxygen and visible light By Sariffuddin Gazi and Rajakumar Ananthakrishnan 
   *RSC Advances* (2) 7781 (2012)

34. C5Li7+ and O2Li5+ as Noble Gas Trapping Agents By S. Pan, M. Contreras, J. Romero, A. Reyes, G. Merino, and P. K. Chattaraj 


   *Chemistry--A European Journal* 18(38) 11968-11975 (2013)

37. Development of 1-Hydroxy-2(1H)-quinolone-Based Photoacid Generators and Photoresponsive Polymer Surfaces By Mohammed Ikbal, Rakesh Banerjee, Dibakar Dhara, Anakuthil Anoop, N. D. Pradeep Singh 

38. Development of 1-Hydroxy-2(1H)-quinolone-Based Photoacid Generators and Photoresponsive Polymer Surfaces By M. Ikbal, R. Banerjee, S. Atta, A. Jana, D. Dhara,* A. Anoop,* N. D. P. Singh* 

39. Design and Synthesis of Mixed Valent Coordination Networks Containing Pyridine appended Terpyridyl, Halide, and Dicarboxylates By K. Banerjee and Kumar Biradha 
   *Crystal Growth & Design* 12, 4264-4274 (2012)

40. Diiminic Schiff Bases: An Intriguing Class for Copper Nanoparticle Induced Fluorescence Study By J. Gwyther, J. B. Gilroy, P. Rupar, D. J. Lunn, E. Kynaston, S. K. Patra, G. Whittell, M. A. Winnik, and I. Manners* 


58. Electrochemistry of surface wired cytochrome c and bioelectrocatalytic sensing of superoxide By Susmita Behera, Ramendra Sundar Dey, Mansa Kumar Rana and C. Retna Raj J. Chemical Sciences press (2013)


60. Exploration of the fluorescence switching phenomenon of curcumin encapsulated niosomes: in vitro real time monitoring of curcumin release to cancer cells By Nagaprasad Puvvada, Shashi Rajput, B. N. Prashanth Kumar, Mahilosh Mandal and Amita Pathak RSC Advances 3, 2553-2557 (2013)


70. Fluorometric sensing of thiocyanate ions and competitive binding of anions in a family of CdII complexes of a phenol based ligand showing diverse structures. By Avijit Sarkar, Valerio Bertolasi and Debasish Ray Polyhedron 44, 113-123. (2012)


76. Green Synthesis of Graphene By S. K. Srivastava and I. Srivastava Journal of Nanoscience and Nanotechnology 2013 (0)


89. Mechanical and thermal properties of silane grafted organomodified montmorillonite reinforced silicone rubber nanocomposites By Pradhan, B. Srivastava, S. K. Saxena, A Journal of Nanoscience and Nanotechnology 2013 (0)


97. MoS2 MWCNT hybrids as a superior anode in lithium-ion batteries By B. Kartick, S. K. Srivastava and S. Mahanty Chemical Communication, 49, 1823-1825 (2013)


100. New μ-hydroxido-bridged copper nitrate dimer and μ4-oxido-bridged copper phenylacetate quasi-tetrahedron: Direct synthesis and uphill conversion By Aloke Kumar Ghaosh and Debashis Ray Polyhedron 52, 370-376 (2013)


108. Phase Boundaries, Structural Characteristics, and NMR Spectra of Ionic Liquid-in-Oil Microemulsions Containing Double Chain Surface Active Ionic Liquid: A Comparative Study
109. Photoinduced DNA cleavage by anthracene based hydroxamic acids
By Nilanjana Chowdhury, Swagata Dasgupta, N.D. Pradeep Singh

110. Photoinduced DNA cleavage by anthracene based hydroxamic acids
By Chowdhury, N., Dasgupta, S., Pradeep Singh, N.D.

111. Photoinduced electron transfer between various coumarin analogues and N,N-
dimethylaniline inside niosome, a nonionic innocuous polyethylene glycol-based surfactant
assembly. By C. Ghatak, V. G. Rao, S. Mandal, N. Sarkar

112. Photophysics of 3,3’-Diethyloxadicarbocyanine Iodide (DODCI) in Ionic Liquid Micelle
and Binary Mixtures of Ionic Liquids: Effect of Con��?nement and Viscosity on
Photoisomerization Rate. By S. Ghosh, S. Mandal, C. Banerjee, V. G. Rao, N. Sarkar

113. Photoremovable protecting groups as controlled-release device for sex pheromone
By Sanghamitra Atta, Mohammed Ikbal, Nishitha Boda, Samiran S. Gauri and N. D.
Pradeep Singh

114. Physical Gelation of Organic Liquids by Achiral Amino Acid Based Amphiphilic
Gelators: Effect of Chirality
By A. Pal, T. Patra and J. Dey

115. Physicochemical Characterization and Self-assembly Studies on Cationic Surfactants
with mPEG Tail
By J. Dey and S. Srivastava

116. Polyelectrolyte-Functionalized Gold Nanoparticle Scaffold for the Sensing of Heparin
and Protamine in Serum
By R.S. Dey, C.R. Raj

117. Polymorphs, Salts and Cocrystals: What’s in a Name?
By S. Aitipamula, R. Banerjee, A. K. Bansal, K. Biradha et al

118. Purification of Gold Organosol by Solid Reagent
By G. Mukherjee and Kumar Biradha
Chemical Communications 48,4293-45 (2012)

119. Protective role of nanoconjugated vancomycin against vancomycin sensitive
Staphylococcus aureus induced oxidative stress and DNA damage.

120. Proton Transfer Reactions in Carbon Nanotubes Endohedrally Functionalized with
Selected Polar Amino Acid Sidechains
By T. G. Abi and Srabani Taraphder
Chemical Physics 405, 107-116 (2012)

121. Pt-Pd alloy nanoparticle-decorated carbon nanotubes: a durable and methanol
tolerant oxygen reduction electrocatalyst
By S. Ghosh, R.K. Sahu, C.R. Raj
Nanotechnology 23 (2012)

122. Purification of Gold Organosol by Solid Reagent
By Ganguly, Mainak Pal, Anjali Pal, Tarasankar

123. Pyrazine functionalized Ag(I) and Au(I)-NHC complexes are potential antibacterial
agents
Franco, P. K. Chattaraj
Current Medicinal Chemistry 19, 4184 (2012)

124. Pyrrole-Based New Diphosphines: Pd and Ni Complexes Bearing the PNP Pincer
Ligand
By Kumar, S. Mani, G. Mondal, S. Chattaraj, P. K.
Inorganic Chemistry 51 (2012)


151. Synthesis of 1-indol-3-yl-carbazoles via Garratt-Braverman cyclization By Mukherjee, Raja Basak, Amit *Synlett* 23, 877 (2012)


Papers Presented in Conferences


Department of Civil Engineering

**Head**
Prof. Subhasis Dey     from 01.01.2013

**Professors**

Baidya, Dilip Kumar    Ph.D.(IISc Bangalore), Reliability in Gotechnical Engg Pile foundations, Soil Dynamics

Barai, Sudhir Kumar    Ph.D.(IISc Bangalore), Soft Computing Applications, Structural Health Monitoring, Recycled Construction Materials, Fracture in Concrete

Bhattacharya, Baidurya    Ph.D. (Johns Hopkins Univ), Computational materials science, Risk and reliability analysis of infrastructure systems

Bhattacharyya, Sriman Kumar    Ph.D.(IIT Kharagpur),

Das Gupta, Shambhu Pada    Ph.D.(IIT Kanpur), constitutive modelling, Soil-Structure Interaction, Foundation Dynamics

Desai, Venkappayya R    Ph.D.(Clemson Univ), Integrated watershed management, Hydrology, Hydraulics

Dey, Subhasish    Ph.D.(IIT Kharagpur), Turbulence, Fluvial Hydraulics, Applied Hydrodynamics

Dhang, Nirjhar    Ph.D.(IIT Kharagpur), Concrete, Dynamics and Control of Railway Bridges, Biomechanics

Ghangrekar, Makarand Madhao    Ph.D (IIT Bombay), Microbial Fuel Cells, UASB reactor for anaerobic wastewater treatment, Water and Wastewater Treatment, Bioenergy recovery during waste management, Wastewater reuse

Gupta, Ashok Kumar    Ph.D.(IIT Bombay), Water and Wastewater Treatment, Environmental Impact Assessment, Air Quality Management, Environmental Planning

Ramachandra, Lingadahally    Ph.D.(IIT Chennai), Stability of Structures, Nonlinear Vibrations, Shell analysis


Sen, Dhrubajyoti    Ph.D.(IIT Delhi), Water resources engineering, Numerical techniques in civil engineering hydraulics

**Associate Professors**

Dash, Sujit Kumar    Ph.D.(IIT Madras), Reinforced soil structures, Shallow foundation, Seismic soil liquefaction


Maity, Damodar    Ph.D.(IIT Kharagpur), Seismic Analysis of Dam, Health Monitoring of Structures, Cost Effective Housing

Roy, Debasis    Ph.D(Univ.of British Colo), Geotechnical Earthquake Engineering, Ground Improvement, In-situ testing of Geomaterials

### Assistant Professors

<table>
<thead>
<tr>
<th>Name</th>
<th>Ph.D. (Institution)</th>
<th>Research Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banerjee, Biswanath</td>
<td>Ph.D. (IISc., Bangalore)</td>
<td>Computational Mechanics, Inverse Problems</td>
</tr>
<tr>
<td>Chakraborty, Sushanta</td>
<td>Ph.D. (IIT Kharagpur)</td>
<td>Fibre Reinforced Plastic Composite Structures</td>
</tr>
<tr>
<td>Deb, Arghya</td>
<td>Ph.D. (Princeton Univ)</td>
<td>Failure and Debonding in concrete, Impact loading on concrete structures, Discrete Element Modelling</td>
</tr>
<tr>
<td>Deb, Kousik</td>
<td>Ph.D. (IIT, Kanpur)</td>
<td>Soil-Structure Interaction, Ground Improvement, Geosynthetic-Reinforced Earth, Numerical Modeling, Soil Arching, Foundation/Embarkment on Soft Soil, Geotechnical Earthquake Engineering, Dynamic Analysis of Rigid Pavement</td>
</tr>
<tr>
<td>Goel, Sudha</td>
<td>Ph.D. (Johns Hopkins Univ)</td>
<td>ENVIRONMENTAL RISK ASSESSMENT, WATER QUALITY AND TREATMENT, SOLID WASTE MANAGEMENT, ENVIRONMENTAL ENGINEERING</td>
</tr>
<tr>
<td>Mitra, Nilanjan</td>
<td>Ph.D. (UW, SEATTLE)</td>
<td>micromechanics, Fluid Structure Interaction, Shock wave, Probabilistic modeling, Computational mechanics, composite structures, reinforced concrete structures</td>
</tr>
<tr>
<td>Mitra, Sudeshna</td>
<td>Ph.D. (ASU, Phoenix)</td>
<td>Transportation Safety, Crash Data Analysis, Statistical and Econometric Applications, Transportation Planning, Traffic Engineering</td>
</tr>
<tr>
<td>Pal, Anjali</td>
<td>Ph.D (Calcutta Univ.), (1) Environmental Engineering and Science (2) Nanoscience (3) Analytical Science</td>
<td></td>
</tr>
<tr>
<td>Verma, Shubha</td>
<td>Ph.D. (IIT Bombay),</td>
<td>Environmental Engineering, Air Pollution, Aerosol Modelling and Climate Impacts</td>
</tr>
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### Senior Lecturer

<table>
<thead>
<tr>
<th>Name</th>
<th>Ph.D. (Institution)</th>
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<tbody>
<tr>
<td>Verma, Shubha</td>
<td>Ph.D. (IIT Bombay),</td>
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### Faculty Appointments

<table>
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<tr>
<th>Name</th>
<th>Position</th>
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<tbody>
<tr>
<td>Anjali Pal</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Paramita Bhattacharya</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Chakraborty, Debarghya</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Biligiri Krishna Prapoorna</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Sudha Goel</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Reddy H P</td>
<td>Assistant Professor</td>
</tr>
</tbody>
</table>
Deb, Kousik  
Associate Professor

Deb, Arghya  
Associate Professor

**Faculty Retirement**

Prof. S. P. Dasgupta  
Professor

**Faculty Re-employment**

Prof. S. P. Dasgupta  
Professor

**Brief Description of on-going activities**

**EnvE:** Microbial Fuel Cells: Application for wastewater treatment and energy recovery, Onsite treatment of domestic sewage from small community, Studies on granulation in UASB reactor treating low strength wastewater to enhance efficiency of the reactor, Water quality and health assessment, Biological treatment of solid waste, Factors affecting the use of chlorine in water supply systems; Nanoparticle synthesis, their characterization and application; Photodegradation of organic pollutants; Adsolubilization/adsorption; Monitoring and modelling of tropospheric solid state polydisperse aerosols and ozone and assessment of pulmonary deposition in Kolkata urban region; Monitoring and modelling of ambient air quality in residential, commercial and industrial regions of Kolkata; Removal of Fluoride from ground water using low cost adsorbents; Removal of Arsenic from ground water using low cost adsorbent; Photocatalytic degradation of dye containing effluents using Ag+ doped TiO2.

**SE:** Recycled construction materials, Stability of plates and shells, Biomechanics, Reliability of bridge structures, Low cost housing, Seismic analysis of dams, Fluid-structure Interactions, Structural Health Monitoring, Finite Element Model updating

**TE:** Cell filled low cost rural roads, Analysis and Evaluation of Concrete and flexible pavements, Specifications for bituminous mixes and Urban transportation planning.

**HWRE:** Investigations of effect of lateral flow on turbulent submerged jets, Study of coherant turbulent structure over gravel beds and bed-forms, development and comparative study of flood inundation models, drought characterization and forecasting, development and comparison of different models for flood forecasting.

**GTE:** Erosion control and mechanical stabilization of soils using natural fibers, ground improvement, soil-microbe interaction, insitu testing, geotechnical earthquake engineering, landslides and slope stabilisation

**Thrust Areas**

1. EnE: Water and Wastewater treatment, Solid Waste Engineering, Environmental Microbiology, Environmental Impact Assessment, Air Pollution Modeling, Bio-energy
2. SE: Reliability engineering, nonlinear mechanics, structural health monitoring, fluid-structure interaction.
5. GTE: Geotechnical earthquake engineering, slope stability, ground improvement, microbe-soil interaction, static and cyclic soil-structure interaction and foundation strengthening of monumental structures.

**New Acquisitions**
1. Seismic piezocone
2. In situ testing vehicle
3. MASW system for shear wave velocity profiling
4. Resonant column for small strain dynamic testing system for soil
5. Digital direct shear apparatus for soil testing
6. Carry Eclipse Fluorescence Spectrophotometer
7. GC, Autolab potentiostat/Galvanostat; Online water quality analyzer, etc.

**International Collaborations**

Scientific collaboration between Duke Univesity, NC, USA (Professor Tuan Vo-Dinh) and Department of Civil Engineering, IIT Kharagpur (Dr. Anjali Pal)

"Center for highway and airport pavement engineering" sponsored by Indo-US scientific technology between Worcester Polytechnic Institute, Worcester, MA, USA and IIT Kharagpur (Dr. M Amarnatha Reddy)

Visiting Scientist to the University of Alberta, Edmonton, Canada during June – July, 2012 for Research Collaboration (Dr. Anjali Pal)

**Doctoral and MS Degrees Awarded**

1. Tumpa Hazra : Improvement of solid waste management system considering direct and indirect costs(Ph.D.)
2. Manaswini Behera : Performance of microbial fuel cell under different operating conditions and employing earthenware as separator(Ph.D.)
3. Ratul Das : Hydrodynamics of mobile sand-bed and immobile-gravel bed(Ph.D.)
4. Raghvendra Singh : Yield and residual shear strengths of non-plastic soils(Ph.D.)

**Member - Professional Bodies**

1. Pal, Anjali, *Life Member* - Chemical Research Society of India
2. Pal, Anjali, *Life Member* - Indian Society for Surface Science and Technology
5. Roy, Debasis, *Member* - Canadian Geotechnical Society
6. Roy, Debasis, *Life Member* - India Geotechnical Society
7. Roy, Debasis, *Associate Member* - American Society of Civil Engineers
9. Roy, Debasis, *Associate Member* - Earthquake Engineering Research Institute
10. Goel, Sudha, *REGULAR* - MEMBER, AMERICAN WATER WORKS ASSOCIATION
11. Goel, Sudha, *Senior Member* - APCBEES
12. Goel, Sudha, *Senior Member* - IEI Committee of Kharagpur Chapter
13. Goel, Sudha, *REGULAR* - MEMBER, INSTITUTION OF ENGINEERS (INDIA)
14. Ghangrekar, Makarand Madhao, *Life Member* - Indian Association for Environmental Management
15. Ghangrekar, Makarand Madhao, *Life Member* - Institution of Engineers (India)
16. Ghangrekar, Makarand Madhao, *Life Member* - Indian Society for Technical Education
17. Ghangrekar, Makarand Madhao, *Member* - International Water Association
19. Reddy, M Amaranatha, *Life Member* - Indian Roads Congress
20. Bhattacharya, Baidurya, *Member* - International Association for Structural Safety and Reliability (IASSAR), Subcommittee on Structural Reliability and Optimization (SC3)
21. Bhattacharya, Baidurya, *Member* - American Society of Civil Engineers
22. Bhattacharya, Baidurya, *Special Invitee* - National Disaster Management Authority, Steering Committee on Geophysical Hazard and Working Committee of Experts on Vulnerability Analysis and Risk Assessment
23. Verma, Shubha, *Member* - Indian Aerosol Science and Technology Association
24. Verma, Shubha, *Organizational Committee India Working Group* - International Global Atmospheric Chemistry (IGAC)
25. Verma, Shubha, *Member* - American Geophysical Union
26. Maity, Rajib, *Life Member* - The Indian Science Congress Association (ISCA)
27. Maity, Rajib, *Life Member* - Indian Society for Hydraulics (ISH)
28. Maity, Rajib, *Member* - American Geophysical Union (AGU)
29. Maity, Rajib, *Member* - International Association of Hydrological Sciences (IAHS)
31. Deb, Kousik, *Life Member* - Indian Geotechnical Society
32. Mitra, Nilanjan, *Associate* - American Concrete Institute
33. Dhar, Anirban, *Life Member* - Indian Society for Hydraulics (ISH)
34. Dhar, Anirban, *Life Member* - The Indian Science Congress Association (ISCA)
35. Dhar, Anirban, *Life Member* - International Association of Hydrological Sciences (IAHS)
36. Dhar, Anirban, *Member* - International Association for Hydro-Environment Engineering and Research (IAHR)
37. Baidya, Dilip Kumar, *Regular* - Member, Int Soc for Soil Mechanics and Geotechnical Engineering
38. Baidya, Dilip Kumar, *Life* - Member, Indian Geotechnical Society
40. Reddy, Kusam Sudhakar, *Member* - NRRDA Executive Council
41. Reddy, Kusam Sudhakar, *Member* - Indian Roads Congress Committee on Asset Management
42. Barai, Sudhir Kumar, *Life Member* - Indian Concrete Institute (ICI), Chennai
43. Barai, Sudhir Kumar, *Life Member* - The Indian Society for Technical Education (ISTE)
44. Barai, Sudhir Kumar, *Life Member* - The Indian Science Congress Association (ISCA)
45. Barai, Sudhir Kumar, *Life Member* - American Society for Civil Engineers India Section (ASCE IS)
46. Barai, Sudhir Kumar, *Life Member* - The International Society of Structure and Multidisciplinary Optimization (ISSMO)
47. Barai, Sudhir Kumar, *Associate Member* - The International Society of Structure and Multidisciplinary Optimization (ISSMO)
48. Barai, Sudhir Kumar, *Member* - International Association of Engineers (IAENG)
49. Barai, Sudhir Kumar, *Member* - Indian Society for Construction Material and Structures (ISCM)
50. Barai, Sudhir Kumar, *Member* - Indian Roads Congress (IRC)
51. Barai, Sudhir Kumar, *Member* - International Association for Life-Cycle Civil Engineering (IALCCE)
52. Barai, Sudhir Kumar, *Member* - Institute of Smart Structures and Systems (ISSS)
53. Barai, Sudhir Kumar, *Member* - Indian Association for Structural Engineering (IASCE)
54. Barai, Sudhir Kumar, *Member* - International Association for Bridge Maintenance and Safety (IABMS)
55. Barai, Sudhir Kumar, *Senior Member* - RILEM
56. Barai, Sudhir Kumar, *Professional Member* - Association for Computing Machinery (ACM)
57. Barai, Sudhir Kumar, *Life Member* - Indian Association for Computational Mechanics (IACM)
58. Barai, Sudhir Kumar, *Member* - Young Researchers Committee, World Federation for Soft Computing (WFSC)
59. Sen, Dhrubajyoti, *Regular* - Indian Society of Hydraulics
60. Sen, Dhrubajyoti, *Regular* - International Association of Hydraulic Research
61. Sen Gupta, Aniruddha, *Associate Member* - American Society of Civil Engineers
62. Sen Gupta, Aniruddha, *Member* - Sigma Xi - The Scientific Research Society
63. Sen Gupta, Aniruddha, *Member* - Chi Epsilon - Civil Engineering Honor Society

**Member - Editorial Board**

5. Bhattacharya, Baidurya (0) Editorial Board Member - International Journal of Engineering Under Uncertainty: Hazards, Assessment and Mitigation
10. Dey, Subhasish (2011) Associate Editor - Acta Geophysica
11. Dey, Subhasish (2011) Associate Editor - International Journal of Sediment Research
13. Dey, Subhasish (2011) Member of Editorial Board - International Review of Civil Engineering
15. Dey, Subhasish (2011) Member of Editorial Board - Flow Measurement and Instrumentation
16. Dey, Subhasish (2011) Associate Editor - Sedimentology
17. Dey, Subhasish (2011) Member of Editorial Board - Engineering Applications of Computational Fluid Mechanics
20. Ghangrekar, Makarand Madhao (2009) Associate Editor - Renewable and Sustainable Energy (RSE)
27. Sen Gupta, Aniruddha (2012) Member of Editorial Board - International J. of Applied Engineering & Technology

**Awards & Honours**

1. Bhattacharya, Baidurya () Adjunct Faculty, Dept of Civil and Environmental Engineering, Newark, DE 19716, USA
2. Gupta, Ashok Kumar (2012) Awarded the Shiksha Rattan Puraskar, award by the IIFS, New Delhi
4. Maity, Rajib (2012) Emerging Leaders Fellowship by Australia India Institute at the University of Melbourne, Australia
5. Deb, Kousik (2012) Fast Track Project Grant for Young Scientists - 2012 from Science and Engineering Research Council (SERC), Department of Science and Technology (DST), India
7. Deb, Kousik (2012) IIT Roorkee Shamsher Prakash Research Award 2012 for Outstanding Research Contribution in Geotechnical Engineering by Young Indian Engineer/Scientist/Researcher below 45 years age
8. Shaws, Amit (2012) Outstanding Young Faculty Award, IIT Kharagpur
9. Maity, Rajib (2012) Prof. R. J. Grade Research Award by the Executive Council of Indian Society for Hydraulics for the year 2012
12. Maity, Rajib (2012) Selected as ASCE 2011 Outstanding Reviewer by the Editor of Journal of Hydrologic Engineering, American Society of Civil Engineers (ACSE)
Fellowships

1. Mitra, Sudeshna (2013) *Raman Fellowship*

Sponsored Research Projects

1. A molecular mechanics investigation of the mechanical properties of amine functionalized CNT in epoxy matrix (ASL, DRDO, Hyderabad, Rs.29.00 Lakhs)
2. A multi-scale investigation of the strength and durability of carbon nanotube based nano-electrode arrays used as biological sensors (DBT, Rs.19.00 Lakhs)
3. A Numerical and Experimental Study of FRP Enhanced Concrete (DST, Rs.17.14 Lakhs)
4. Advanced Research Laboratory on Safety and Uncertainty Analyses of Infrastructure Systems (BARC, Mumbai, Rs.150.00 Lakhs)
5. Aerosol Chemical and Optical characteristics over an urban coastal city in the Ganges Delta (SRIC, Rs.3.00 Lakhs)
6. Application of geocell reinforcement for performance improvement of anchored foundations under uplift (SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
7. Arresting delamination propagation of sandwich composite panels with initial face/core debond subjected to inplane compression load (SRIC-ISIRD, Rs.5.00 Lakhs)
8. Assessment of Various Strategies of Seating Arrangements for Indian Rail Coaches from the viewpoint of Occupant's Safety (RDSO through Center for Railway Research, Rs.29.52 Lakhs)
9. Bridge scour estimation, measurement and protection and use of various time systems like TDR, TTS and SA (RDSO, Rs.152.00 Lakhs)
10. Characterization of Ballistic Performance of Ceramic-Metal Composite Armour against Armour Piercing (AP) Projectile (SRIC, Rs.5.00 Lakhs)
11. Consultancy Services to Study the Ramps on Bally Side from Old G. T. Road to Sister Nivedita Bridge on NH-2 near Kolkata in West Bengal (NHAI, Govt. of India, Rs.0.00 Lakhs)
12. Creep and warping (including gauge widening) analysis of hot running loco wheels towards development of design guidelines against gauge widening (RDSO, Rs.49.79 Lakhs)
13. Damage assessment of aircraft structures from limited vibration data (ARDB, GOI, Rs.8.45 Lakhs)
14. Determination of leishmanicidial potential of metal nanoparticles and their conjugates (Calcutta University, Rs.2.00 Lakhs)
15. Developing a Suitable Methodology for Identifying Accident Prone Sites in the Presence of Limited Data (ISIRD, IIT Kharagpur, Rs.5.00 Lakhs)
16. Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-Learning (MHRD, Rs.8.00 Lakhs)
17. Development of a video course on ‘Probability methods for Civil Engineering’ (National Programme on Technology Enhanced Learning (NPTel), Ministry of Human Resources & Developmen, Rs.5.00 Lakhs)
18. Development of a video course on ‘Numerical methods for Civil Engineering’ (National Programme on Technology Enhanced Learning (NPTEL), Rs.2.50 Lakhs)
19. Development of a video course on Groundwater Hydrology (National Programme on Technology Enhanced Learning (NPTel), Ministry of Human Resource Development, Rs.0.00 Lakhs)
20. Development of a video course on Transportation Economics (National Programme on Technology Enhanced Learning (NPTel), MHRD, Govt. of India, Rs.0.00 Lakhs)
21. Development of Design Methodology for Chemically Treated Bamboo Reinforced Concrete members for Low Cost Housing (BMTPC, GOI, Rs.16.80 Lakhs)
22. Development of durable water repellent jute geotextile (Jute Manufacturers Development Council, Rs.168.72 Lakhs)
23. Development of e-courses for B.Tech. (Agricultural Engineering) Degree Programme, Soil Mechanics (National Agricultural Innovation Project (NAIP), Rs.0.50 Lakhs)
24. Development of Guidelines for Use of Different Types of Bus in India - Phase I (HUBNER, Germany, Rs.0.00 Lakhs)
25. Development of microbial fuel cell for direct electricity recovery during waste water treatment (DST, Rs.61.00 Lakhs)
26. Development of Provisions for Design of Steel Concrete Railway Bridge for normal speed and special provision for high speed passenger traffic (RDSO, Rs.118.95 Lakhs)
27. Development of Public Transport for Dammam Urban Area in Saudi Arabia (Gulf Engineering House, Rs.0.00 Lakhs)
28. Development of Public Transport for Zajan Territory in Saudi Arabia (Gulf Engineering House, Rs.0.00 Lakhs)
29. Effects of Fines on Behavior of Geosynthetic-Reinforced Sands (Indian Institute of Technology Kharagpur, Rs.5.00 Lakhs)
30. Efficiency study of Damodar left bank irrigation system (Ministry of Water Resources, Government of India, Rs.48.96 Lakhs)
31. ELECTROCOAGULATION IN CONTINUOUS-FLOW SYSTEMS FOR REMOVAL OF DRINKING WATER CONTAMINANTS (DST-WTI, Rs.35.90 Lakhs)
32. Energy efficiency, community based water and waste water treatment systems for development in India (DST, New Delhi, Rs.17.50 Lakhs)
33. Experimental & Numerical Studies on Deep Excavation under Static & Seismic Conditions (SERB, DST, New Delhi, Rs.73.00 Lakhs)
34. Experimental and Numerical Studies on Stone Column-Supported Embankments Resting on Soft Soil (Department of Science and Technology, SERB, India, Rs.18.90 Lakhs)
35. Exploratory investigation on Development of Damage Mechanics based Methodologies for Lifting of Aeroengine Components (DMRL, Rs.10.00 Lakhs)
36. Feasibility Study for Proposed Grade Separated Intersection at the Junction of Belghoria Expressway and Kalyani-Dumdum Expressway (KMDA, Govt. of West Bengal, Rs.0.00 Lakhs)
37. First order seismic microzonation of Kolkata area (Ministry of Earth Sciences, Goverment of India, Rs.62.10 Lakhs)
38. Ganga River Basin - Environment Management Plan (MoEF, Rs.30.00 Lakhs)
39. Guidelines for Bicycle Infrastructure Design and Policy (HSMI, HUDCO, Rs.17.20 Lakhs)
40. HYDRODRIL (European Union, Rs.200.00 Lakhs)
41. Hydrologic sensitivity to Cryosphere-Aerosol interaction in Mountain Processes (DST, India; RCN, Norway, Rs.0.00 Lakhs)
42. Improving mechanical performance and delamination resistance in sandwich composite panels (Department of Science and Technology (DST/SERC), India, Rs.25.00 Lakhs)
43. Managing change in Soil Moisture and Agricultural Productivity under a Global Warming scenario using a Catchment Scale Climate Change Assessment Frame (Australia-India Strategic Research Funds (AISRF), Rs.33.00 Lakhs)
44. Multi-scale modeling of defects and interfacial phenomena in CNT-based nanocomposites (DST, Rs.21.00 Lakhs)
45. NPTEL Phase II, Video Course Development on Advanced Foundation Engineering (Ministry of Human Resource Development (MHRD), Govt. of India, Rs.2.50 Lakhs)
46. Optimization of rib pattern in steel rebars to achieve enhanced fatigue life and good bond strength (Tata Steel, Rs.10.65 Lakhs)
47. Pilot Phase of the National Mission Project on Pedagogic Development for the course 'Hydraulics' (National Mission Project on Education through ICT, Ministry of Human Resource Development, GOI, Rs.0.00 Lakhs)
48. Pilot Phase of the National Mission Project on Pedagogic Development for the course 'Water Resources Engineering' (National Mission Project on Education through ICT, Ministry of Human Resource Development, Governmen, Rs.5.00 Lakhs)
49. Pilot Phase of the National Mission Project on Pedagogic Development for the course 'Solid Mechanics' (National Mission Project on Education through ICT, MHRD, Govt. of India, Rs.0.00 Lakhs)
50. Pilot Phase of the National Mission Project on Pedagogic Development for the course 'Transportation Enginerring' (National Mission Project on Education through ICT, MHRD, Govt of India, Rs.0.00 Lakhs)
51. Preparation of Ganga River Basin Management Plan (National River Conservation Directorate, MOEF, INDIA, Rs.0.00 Lakhs)
52. Production of Ligonocellulosic Fuels: from Lab to Pilot Scale (PLF) (DBT, Rs.345.84 Lakhs)
53. Seismic Evaluation of Aged Concrete Gravity Dams (ISRD, IIT Kharagpur, Rs.3.00 Lakhs)
54. Seismic Hazard Assessment, Microzonation and Evaluation of Vulnerability, Risk & Socio-
Economic Impacts for the City of Kolkata (Ministry of Earth Sciences, New Delhi, Rs.370.99 Lakhs)
55. Smarter Water Resource Management, Disaster Mitigation & Diabetic Retinopathy
(WDD) (IBM, Rs.0.00 Lakhs)
56. Strengthening the Research & Postgraduate Teaching in the Areas of Structural,
Geotechnical, Environmental & Transportation Engg. (Department of Science and Technology, New Delhi, Rs.245.00 Lakhs)
57. Submicron aerosols in east India: sources, chemical characteristics, climate impacts (DST, Rs.14.00 Lakhs)
58. Swaralipi: a system for scripting Tagore’s musical notes and transcoding (SNLTR, Govt. of West Bengal, Rs.9.00 Lakhs)
59. Synthesis and characterization of mono and bimetallic nanoparticles on supported systems and their application for the degradation of organic pollutant (IIT Kharagpur (under ISIRD), Rs.5.00 Lakhs)
60. Theoretical and Experimental Investigations on the Stability and Chaotic Behavior of Non-
Smooth Flexible, Curved and Twisted Pipe subjected to Followe (IIT- Kharagpur (ISIRD-SRIC Scheme), Rs.1.00 Lakhs)
61. Underwater Ballistic Response of Marine Grade Sandwich Composite Panels (Naval Research Board, INDIA, Rs.0.00 Lakhs)
62. Underwater non-contact explosive response of marine grade sandwich composite panels (Naval Research Board (NRB/DRDO), India, Rs.72.00 Lakhs)
63. Virtual Lab - Soft Computing Tools in Engineering (MHRD, New Delhi, Rs.42.90 Lakhs)

Consultancy Projects

1. Advice- L&T ECC division Chennai (L&T ECC divison Chennai, Rs.1.37 Lakhs)
2. Bituminous Mix Design for NH-54 in the state of Assm (M/s Punjlloyd Ltd, Assam, Rs.0.56 Lakhs)
3. Calibration of fifth wheel bump integrator- ARUR (ARUR, Rs.0.50 Lakhs)
4. Characterisation of different normal, modified bitumen and emulsions of SHELL (M/s Shell India Markets Pvt Ltd, Guragon, Rs.5.51 Lakhs)
5. Design Scheme for Launching of PSC Girder (ITD Cementation India Limited, Rs.1.00 Lakhs)
6. Development of reliability based criteria for containment design (BARC, Rs.10.00 Lakhs)
7. Development of suitable probability density functions for characterization of wave speed measurements in concrete (CMERI, Rs.2.00 Lakhs)
8. Development plan preparation for Korba urban area, Chattisgarh, (The Director, Directorate of Town & Country Planning, R.D.A., Rs.29.91 Lakhs)
9. Establishment of Indian Institute of Corporate Affairs (Ministry of Corporate Affairs, N. Delhi, Rs.160.70 Lakhs)
10. Evaluation & modification of tank foundations at JSL (EMTF) (BOC India Ltd, Kolkata, Rs.3.00 Lakhs)
11. Evaluation of different subgrade soils using JG soil modifier (Jindal Steel, Rs.6.72 Lakhs)
12. Evaluation of elastic modulus and complex modulus of CRMB binder (M/s Gammon India Pvt Ltd, Muzzaffarpur, Rs.0.55 Lakhs)
13. EVALUATION OF MATERIAL AND CONCRETE MIX DESIGN (NIT Raipur, Rs.2.20 Lakhs)
14. Evaluation of modified bitumen and bitumen emulsions (Miscellaneous Agencies, Rs.1.00 Lakhs)
15. Evaluation of railway ballast, road aggregates and other pavement materials for different agencies (Miscellaneous Agencies, Rs.1.25 Lakhs)
16. Evaluation of Subgrade soils using Stabilig soil modifier (M/s Satibilig Road Solutions Pvt Ltd, Gurgaon, Rs.1.69 Lakhs)
17. Impact Assessment of Light and Sound show at Khandagiri and (Deputy Secretary,Department of Tourism and Culture (Tourism),, Rs.6.74 Lakhs)
18. Inspection & Testing of 100-m Transmission Tower at AIR, Kohima (TMTA) (All India Radio & Doordarshan, Kolkata, Rs.3.00 Lakhs)
19. -- Checking design and drawing of UASB type sewage treatment plant (CDST) (Apporv Air Control, Jaipur, Rs.3.25 Lakhs)
20. Kamakhya Resort and Spa, Dharmasala (Kamakhya Resorts Pvt. Ltd., Rs.2.50 Lakhs)
21. Liquefaction Study of the Site for Steel Complex at Gokulpur (SSCG) (Rashmi Metaliks, Ltd, Kolkata, Rs.86034.00 Lakhs)
22. Mathematical model study for Ghatal Master Plan (WAPCOS, Rs.22.00 Lakhs)
23. Mathematical model study for Kandi project (WAPCOS, Rs.14.00 Lakhs)
24. Mix Design for the work- Improvement of Rajbandh Area on NH-2 in the state of W.B (PWD, West Bengal, Rs.2.50 Lakhs)
25. Model Study for CW system equipment package for Vallur Thermal Power Project (3X500 MW) and for Barh STPP, Stage-II (2X660 MW) (WPIL Limited, Kolkata, Rs.29.00 Lakhs)
26. Optimized properties of galvanized steel (Tata Steel, Rs.6.00 Lakhs)
27. P K Sinha Centre Project (PKS) (Dr. Prabhakant Sinha, Rs.0.00 Lakhs)
28. Performance evaluation study in respect of work - Keliaghai-Kapaleswari-Baghai Drainage basin scheme - (Phase-II, 2012-2013) (Flood Management Programme, Govt. of INDIA and Govt. of West Bengal, Rs.0.00 Lakhs)
29. Performance Evaluation Study on Flood Control Scheme for Kapaleswari-Keliaghai-Baghai (KKB) Drainage Basin for Phase-II, 2012-2013 (Govt. of West Bengal, Rs.20.00 Lakhs)
30. Physical, Chemical, Instrumental analysis and Bacteriological Examination of Water (Office of the AGE E/M (AF) Salua, Rs.2.25 Lakhs)
31. Planning and design of transportation facilities for info park in Kochi (Cannon Design International Pvt. Ltd., Rs.2.20 Lakhs)
32. Planning of transportation facilities within the premise of the proposed IT campus of TCS at Bhubaneswar (Cannon Design International Pvt. Ltd., Rs.3.63 Lakhs)
33. Preparation of Air Quality Evaluation Report of Haldia. (HEL, Kolkata, Rs.10.11 Lakhs)
34. Preparation of Aizawl Master Plan (PAMP) (Aizwal Development Authority, Rs.70.22 Lakhs)
35. Preparation of city development plan for Burdwan planning area (BDAP) (BDA, Burdwan, Rs.11.23 Lakhs)
36. Preparation of detailed design for Chromium Effluent Treatment Plant (Saruabil Chromite Mines, M/s Misrilill Mines (P) Ltd., Djapur Road, Rs.22.47 Lakhs)
37. Preparation of DPR for MCL coal Transportation roads of IB valley Project (Mahanadi Coalfields Limited, Sambalpur, Rs.27.12 Lakhs)
38. Preparation of DPR for Repair/renovation of SH 8 (PWD West Bengal, Rs.9.50 Lakhs)
39. Preparation of Feasibility Study Report on Establishment of Common Effluent Treatment Plant(s) in Sukinda Valley Area (State Pollution Control Board Orissa, Rs.22.06 Lakhs)
40. Preparation of Zonal Developmental Plan for 14 Planning Zones of Bhubaneswar Development Plan Area (Bhubaneswar Development Authority, Rs.391.63 Lakhs)
41. Proof checking of design basis report of the prefab roof for printing plant (ABP Pvt. Ltd., Kolkata, Rs.1.10 Lakhs)
42. Proof Checking of Design of Conveyer Gallery Structures J3-C3 and J3-C4 in between Trestles TR1 and TR2 and Foot Over Bridge (S.K. Samanta & Co. (P) Ltd., Kolkata, Rs.6.61 Lakhs)
43. Proof Checking of Pavement Design (M/s Sheladia Associates, Rs.1.00 Lakhs)
44. Proof Checking of pavement design for NH-34 (HCC Ltd, Malda, W.B, Rs.2.00 Lakhs)
45. Quality Investigation of materials (Various Govt. Agencies, Rs.5.50 Lakhs)
46. Rectification of defects in PSC girder of Bridge No. 557 across river Kuakhai near Cuttack (Expert_SPA(JV), Bhubaneswar, Rs.4.41 Lakhs)
47. Review and scrutiny of seismic designs for earth structures (Sardar Sarovar Narmada Nigam Limited, Gandhinagar, Rs.2.20 Lakhs)
48. Revision/Amendment of the Landuse and Development Control Planfor Old Haldia Planning Area (HDA, Haldia, Rs.55.15 Lakhs)
49. Seismic Vulnerability Assessment of Building Types in India (NDMA, Rs.25.20 Lakhs)
50. Stability & Strength Test for Q-0, Dunguri Lime Stone Quarry (SFDL) (ACC Ltd, Bargarh Cement Works, Bargarh, Orissa, Rs.165000.00 Lakhs)
51. Storm water outflow drainage plan and subsurface drainage plan (Keventer Projects Ltd., Kolkata, Rs.6.18 Lakhs)
52. Strengthening of Weak Formation and Rehabilitation Work in Malda Division of Eastern Railway (WFAW) (Eastern Railway, Rs.8.65 Lakhs)
53. Structural Health Assessment of HP Housing at Taraatola (HPCL, Rs.0.00 Lakhs)
54. subsurface investigation and design of ground improvement for Paradip Port Stack Yard (Paradip Port Trust, Rs.12.36 Lakhs)
55. Technical Review of Current 24X7 Water Distribution Project in Mysore (JUSCO, Rs.39.70 Lakhs)

56. Technical Vetting of 150 Mts. Tower Specifications (Prasar Bharati, Kolkata, Rs.1.37 Lakhs)

57. Testing of sample of water, concreting purpose (CIVTEC (I) PVT. LTD, Kolkata, Rs.0.12 Lakhs)

58. Testing of water sample for the proposed Institute Campus of Nation Institute of Biomedical Genomics, Kalyani (Kalaikunda Air field, Rs.1.65 Lakhs)

59. Third Party Inspection of Construction of Pravasi Bharatiya Kendra (MOIA, Rs.88.24 Lakhs)

60. Tokisud flood protection embankment vvetting (GVK Coal, Rs.7.08 Lakhs)

61. Traffic Impact Study and Planning of Transportation Facilities for the Proposed Smart City in Kochi (Cannon Design International Pvt. Ltd., Rs.7.00 Lakhs)

62. Vertical turbine type cw pump suction problems due to pump-system interaction (WPIL Limited, Kolkata, Rs.5.70 Lakhs)

63. Vetting design of elevated canal structure (Scott Wilson Pvt. Ltd., Rs.25.00 Lakhs)

64. Vetting the Design of DNMC Canal and Associated Hydraulic Structures (Scott Wilson India Private Limited (SWIPL), Rs.24.00 Lakhs)

65. Wastewater and solid waste sampling for food processing industry (Basukinath Pvt. Ltd., Rs.0.17 Lakhs)

Visits Abroad by Faculty Members

1. Maity, Rajib - BOYSCAST Fellowship (Purdue University, USA, ) 11 Aug 2011 to 30 Dec 2011
2. Maity, Rajib - Research Collaboration (University of New South Wales, Sydney, Australia, ) 22-26 June 2012
3. Dey, Subhasish - Short course (Taichung, Taiwan, ) 1 to 4 July 2012
4. Dey, Subhasish - Invited lecture (Taipei, Taiwan, ) 5 July 2012
5. Dey, Subhasish - Field visit (New Zealand, ) 9 to 15 December, 2012
6. Mitra, Nilanjan - Attend World conference in earthquake engineering conference (lisbon, portugal, ) 6 days
7. Mitra, Nilanjan - Attend World conference in computational mechanics (Sao Paulo, Brazil, ) 10 days
8. Mitra, Nilanjan - Avail DAAD Research Stay fellowship (Darmstadt, Germany, ) 2 months
10. Sen Gupta, Aniruddha - To Attend 2nd Intl Conf. on Geotechnology, Construction Materials and Environment (Kuala Lumpur, Malaysia, ) Nov. 14-16, 2012

Invited Lectures by Faculty Members

1. Turbulent flow, sediment transport and scour by Dey, Subhasish (National Chung Hsing University, Taiwan)
2. Turbulence in mobile bed streams by Dey, Subhasish (National Taiwan University, Taiwan)
3. Turbulence in mobile bed streams by Dey, Subhasish (The University of Auckland, New Zealand)
4. Turbulence in mobile bed streams by Dey, Subhasish (IIT Guwahati)
5. Environmental Protection Solid Waste Management by Goel, Sudha (ITI Midnapore - NCC Cadets of 3 districts of WB)
6. Dye wastewater treatment by adsolubilization and advanced oxidation processes mediated by nanopartic by Pal, Anjali (Raipur, Chattisgarh)
7. Women in Engineering: to BE or not to BE by Goel, Sudha (Indo-US Symposium on Women in Engineering sponsored by Society of Women Engineers, USA, in Bengaluru)
8. Environment Week celebrations by NCC cadets of IITKgp by Goel, Sudha (IIT Kharagpur)
10. Dye wastewater treatment by adsolubilization and advanced oxidation processes by Pal, Anjali (College of Engineering and Management, Kolaghat)
11. Chitosan: An efficient smart biopolymer for surfactant removal and synergism on dye adsorption by Pal, Anjali (IIT Kharagpur)
12. Hydroclimatic Teleconnection in the Context of Climate Forcing on Hydrologic Variables: An Indian... by Maity, Rajib (Australia India Institute, Melbourne University, Melbourne, Australia)
13. Evolutionary Computation for Financial Modelling by Barai, Sudhir Kumar (IIT Kharagpur)
14. Industrial Growth through Skill Building by Barai, Sudhir Kumar (PDU, Gandhinagar)
15. How to Make Good Technical Presentation and Technical Paper Writing by Barai, Sudhir Kumar (GTU, Ahmedabad, India)
16. High Performance Computational Intelligence Tool for Structural Optimization by Barai, Sudhir Kumar (GTU, Ahmedabad, India)
17. High Performance Computational Intelligence Tool for Structural Optimization by Barai, Sudhir Kumar (NIT Warangal)
18. Real-time rainfall monitoring and runoff simulation for Kolkata by Sen, Dhrubajyoti (IIT Bombay)
20. Frontiers in Road Safety Research by Mitra, Sudeshna (SVNIT, Surat)
21. Aerosols and their climate impacts: scenario over Indian subcontinent and ocean by Verma, Shubha (Indian Institute of Technology Madras)

Books Published


Papers Published in Journals

2. 3-D Finite Element Analysis for Dynamic Response of Rigid Pavement Subjected to Moving Load By V. A. Sawant, V. A. Patil and Kousik Deb Journal of Structural Engineering Accepted (2013)


14. Depth-averaged model including velocity deformation for unsteady open channel flows By Langhi M, Hosoda T and Dey S *Journal of Japan Society of Civil Engineers (JSCE)* 68, pp. I_67-I_72 (2012)


Papers Presented in Conferences

1. Aerosol Radiative Forcing Over India During the Winter Monsoon Due to Emissions from Source Categories and Geographical Regions, By Shubha Verma, AOGS - AGU (WPGM) Joint Assembly, Singapore, (2012)


7. Damage Assessment of Beam Structures from Change in Curvature Mode Shape using Unified Particle Swarm Optimization Technique, By Bharadwaj Nanda, Damodar Maity and Dipak Kumar Maiti, 4th International Congress on Computational Mechanics and Simulation (ICCMS-12), IIT Hyderabad, India, (2012)


10. ELECTROCOAGULATION OF DRINKING WATER IN CONTINUOUS FLOW MODE, By KRUTTIKA APSHANKAR, ITI SHARMA, AYON MOHON GHOSH, SUDHA GOEL, *9th All India People's Technology Congress by FOSET*, Science City, Kolkata, (2013)


28. Performance of Sand & Shredded Rubber Tire Mixture as a Natural Seismic Base Isolator, By S. Bandyopadhyay, A. Sengupta, G.R. Reddy, *7th Intl Conf. on Case Histories in...*


Department of Computer Science & Engineering

Head
Prof. Jayanta Mukhopadhyay

Professors
Basu, Anupam Ph.D.(IIT Kharagpur),
Chakrabarti, Partha Pratim Ph.D.(IIT Kharagpur), Artificial Intelligence, CAD for VLSI & Embedded Systems, Design of Algorithms, Reliable and Fault Tolerant Systems
Das, Partha Pratim Ph.D.(IIT Kharagpur), Image Processing, Software Engineering, Language Translation, Object-Oriented Analysis & Design
Dasgupta, Pallab Ph.D.(IIT Kharagpur), VLSI CAD & Electronic Design Automation, Formal Verification
Ghose, Sujoy Ph.D.(IIT Kharagpur), System Intelligence, Networking, Algorithms
Gupta, Arobinda Ph.D.(Iowa), Distributed Systems, Mobile Computing
Kumar, Rajeev Ph.D.(Sheffield), Programming Language & Software Engineering, Multiobjective Optimization & Evolutionary Computing, EDA & Embedded Systems, Multimedia Systems & Video Transcoding, Education Standards & Quality
Majumder, Arun Kumar Ph.D.(Cal),Ph.D.(Florida), Database and Multimedia Systems, Information Security, Medical Informatics and Telemedicine
Mall, Rajib Ph.D.(IISc Bangalore), program analysis and testing
Mandal, Chittaranjan Ph.D.(IIT Kharagpur), VLSI CAD, Networking, Formal Verification
Mukhopadhyay, Jayanta Ph.D.(IIT Kharagpur), Image Processing, Medical Informatics, Bioinformatics
Pal, Ajit Ph.D.(Calcutta Univ), CAD for Low Power Embedded systems Computer Networks
Pal, Sudebkumar Prasant Ph.D.(IISc Bangalore), Design and analysis of algorithms, Computational and combinatorial geometry
Sarkar, Dipankar Ph.D.(IIT Kharagpur),
Sarkar, Sudeshna Ph.D.(IIT Kharagpur), Machine learning, Natural Language Processing, Data Mining
Sengupta, Indranil Ph.D.(Calcutta Univ), VLSI design and testing, Cryptography and network security, Reversible computing

Associate Professors
Das, Abhijit Ph.D.(IISc Bangalore), Cryptography, Computational Number Theory, Parallel and Distributed Implementations
Ganguly, Niloy Ph.D.(BESU, Calcutta), Peer-to-peer Networks, Online Social
networks, Network Theory, Wireless Internet, Delay Tolerant Networks

Mitra, Pabitra  
*Ph.D. (ISI Calcutta)*, Machine Learning, Data Mining, Information Retrieval

Mukhopadhyay, Debdeep  
*Ph.D. (IIT Kharagpur)*, Computer Architecture and Security, Cryptology, VLSI, Embedded systems for Cryptographic Systems, Side Channel Analysis

**Assistant Professors**

Chakraborty, Rajat Subhra  
*Ph.D. (CWR Univ. USA)*, Hardware Design for Security, Digital Watermarking, VLSI Design and Methodologies

Dey, Soumyajit  

Mitra, Bivas  
*Ph.D. (IIT Kharagpur)*,

Mitra, Pralay  
*Ph.D. (IISc. Bangalore)*, Computational Biology, Bioinformatics

Mukherjee, Animesh  
*Ph.D. (IIT Kharagpur)*, Complex systems, language dynamics, social computation, web social media

**Lecturer**

Dey, Partha Sarathi  
*M.Tech. (IIT Kharagpur)*, Multi Core Architecture, Operating System, VLSI, Embedded Systems

**Faculty Appointments**

Pralay Mitra  
Assistant Professor

Bivas Mitra  
Assistant Professor

Sourangshu Bhattacharya  
Assistant Professor

Pawan Goyal  
Assistant Professor

Soumyajit Dey  
Assistant Professor

**Brief Description of on-going activities**


**Thrust Areas**

1. Artificial Intelligence
2. VLSI Design and CAD tools
3. Cryptography
4. Hardware and Embedded Security
5. Natural Language Processing
6. Image Processing
7. Complex and Social Networks
**International Collaborations**

"Design and Implementation of Wireless Embedded Sensor Networks Based Old Age Home Monitoring" under India-Taiwan Programme of Cooperation in Science and Technology. Rajib Mall and Pabitra Mitra

New perspectives for computational social science, DST, India and Ministry of External Affairs, Italy, University of Rome, Italy, Animesh Mukherjee

Understanding, Leveraging and Deploying Online Social Networks, Joint project with MPI-SWS, Saarbrucken, Niloy Ganguly.

Joint Publication with TU Dresden, Germany, Duke University, USA, University of Nice, France, University of Bielefeld, Germany, UFOP, Ouro Preto, Brazil, ETH Zurich, MPI-SWS, Saarbrucken. Niloy Ganguly

Joint Publication with researchers from Georgia Tech, USA, Case Western Reserve, USA, NTU Singapore, Debdeep Mukhopadhyay.

Joint Publications with researchers in Stanford University, Georgia Tech, Carleton University, Canada, ISI Kolkata, (Collaborators: Arindam Khan, Mridul Aanjaneya, Subhas C Nandy, Arijit Bishnu), Sudebkumar P. Pal

Joint Publication with Yeditepe University, Turkey, Rajat Subhra Chakraborty and Debdeep Mukhopadhyay

Joint Publication with University of Nebraska Omaha, Niloy Ganguly and Animesh Mukherjee

Joint organization of workshop Proofs 2013 along with CHES 2013, Santa Barbara USA.

**Lectures by Visiting Experts**

1. Annotating Images with Words, Phrases and Sentences by Prof. C. V. Jawahar (IIIT Hyderabad)
2. Turning Inspiration into Critical Customer Assets by Dr Sugato Chakraborty (Manager of Strategic Initiatives Xerox Research India)
3. Design Automation for Digital Microfluidic Biochips: From Fluidic-Level Toward Chip-Level by Dr. Tsung-Yi Ho (Department of Computer Science and Information Engineering National Cheng Kung University Taiwan)
4. ARM Architecture Fundamentals by Mrinmoy Ghosh (Scientist ARM)
5. CloudAdvisor: A Recommendation-as-a-Service Platform for Cloud Configuration and Pricing by Dr Tridib Mukherjee (Xerox Research Centre India)
6. An Adaptive and Self-Healing Approach by Dr. Swaroop Ghosh (Faculty University of South Florida USA)
7. Trace Collection and Fault Localization for Data-centric Programs by Diptikalyan Saha (IBM Research)
8. Bounded Model Checking and HW - SW Co-verification by Dr. M. K. Srivas (Faculty Computer Science Department Chennai Mathematical Institute)
9. Automation in process industry and Computer Science in Automation with an interesting example by Dr. Arya Bhattacharya (Head Automation Division Tata Steel)
10. Block Cipher Modes for Disk Encryption by Debrup Chakraborty (CINVESTAV-IPN Mexico)
11. Quantifying Semantics and Contextualizing Distributional Similarity by Chris Biemann (Professor Technische Universität Damstadt)
12. Computational Creativity by Prof. Philippe Pasquier (Assistant Professor SIAT Simon Fraser University)
13. Diffusion in Social Networks by Vineet Chaoji (Scientist Advertising Sciences Yahoo! Labs Bangalore)
14. Network effects of risk behavior change following prophylactic interventions by Dr. Ravi Sundaram (Associate Professor Northeastern University College of Computer and Information Science Boston, USA)
15. Learning in a Small World by Dr. Balaraman Ravindran (Associate Professor Department of Computer Science & Engineering Indian Institute of Technology, Madras)
16. Entity-relationship Search at Web Scale by Dr. Soumen Chakrabarti (Associate Professor Department of Computer Science & Engineering Indian Institute of Technology, Bombay)
17. Towards Practical and Efficient Distributed Trust by Dr. Aniket Kate (Head Cryptographic Systems Research Group Saarland university Germany)
18. Approximation Algorithms for Unsplittable Flow and Interval Coloring Problems by Arindam Pal (Department of CSE IIT Delhi)
19. The Theory of Graph Games: Mixing Chess, Soccer and Poker by Dr. Krishnendu Chatterjee (Institute of Science and Technology Austria)
20. Precision Timed Computing in the Synchronous Setting by Dr Partha Sarathy Roop (Dept. of Electrical and Computer Engineering Univ of Auckland New Zealand)
21. How to Unleash Massive Parallelism of your Laptop? A Massively Parallel Priority Queue Data Structure on GPUs by Prof. Sushil K. Prasad (Professor Computer Science Department Georgia State University)

**Doctoral and MS Degrees Awarded**

1. Pramit Roy : Misbehavior Detection in Vanet Using Secondary Information(MS)
2. Chandan Karfa : Formal Verification of Behavioural Transformations During Embedded System Design(PhD)
3. Satrajit Ghosh : Improvements of Linearization-Based Algebraic Attacks on Block Ciphers(MS)
4. Debjit Pal : Automated Mixed-Signal Verification Using Monitors and Simulation Relations(MS)
5. Sujoy Sinha Roy : Design and Analysis of Elliptic Curve Cryptosystems on FPGAs(MS)
6. Sumit Das : Computational Approach Improving Fluency in Bangla Sentence Generation(MS)
8. Joydeep Chandra : Topology and its Effects on the Performance of Peer-to-Peer Networks(PhD)
9. Biswavijit Das : Automatic Speech Recognition of Aging Speech in Bengali(MS)
10. Subhankar Mukherjee : Assertions: From a Mixed-Signal Perspective(PhD)
11. Pravanjan Choudhury : New Multiprocessor Scheduling Techniques for Dynamic Task Graphs(PhD)
12. Chandan Misra : A software system for transcribing and rendering indic music system(MS)
13. Soumen Bag : Processing and analysis of Bangla optical characters using geometric and topological features(PhD)
14. Saptarshi Ghosh : Online Social Networks: Evaluation and Search(PhD)
16. Dinesh Dash : Geometric algorithms for coverage in wireless sensor networks(PhD)
17. Sk. Subidh Ali : Differential Fault Analysis of Block Ciphers(PhD)
19. Arnab Sarkar : New Approaches in Real-Time Proportional Fair Multi-Processor Scheduling(PhD)
20. Sourya Bhattacharyya : (MS)
21. Srisendu Mohanta : (MS)
22. Debi Prosad Dogra : Algorithms for Video Assisted Analysis of Infant Neurological Examinations(PhD)
23. Sourasis Das : Formal Methods for Improving Test and Assertion Coverage(MS)
Member - Professional Bodies

1. Kumar, Rajeev, Senior Member - IEEE
2. Kumar, Rajeev, Senior Member - ACM
3. Ganguly, Niloy, Regular - IEEE Comsoc
4. Ganguly, Niloy, Member - ACM
5. Mukhopadhyay, Debdeep, Member - ACM-SIGDA
6. Das, Partha Pratim, Member - Association for Computing Machinery
7. Das, Partha Pratim, Member - VLSI Society of India
8. Majumder, Arun Kumar, - Senior Member Institution of Electrical and Electronic Engineers USA
9. Dey, Partha Sarathi, Regular - IEEE Computer Society
10. Chakrabarti, Partha Pratim, Senior Member - IEEE
11. Chakrabarti, Partha Pratim, Member - ACM
12. Sengupta, Indranil, Member - IEEE
13. Mukhopadhyay, Jayanta, Life member - Telemedicine Society of India
14. Mukhopadhyay, Jayanta, Senior - IEEE
15. Mukhopadhyay, Jayanta, Life Member - Indian Association for Medical Informatics (IAMi)
16. Dasgupta, Pallab, Regular - ACM
17. Dasgupta, Pallab, Senior - IEEE
18. Roychowdhury, Dipanwita, Life member - CRSI (Cryptology Research Society of India)
19. Roychowdhury, Dipanwita, Regular - IEEE
20. Sarkar, Sudeshna, member - ACM
21. Mandal, Chittaranjan, Regular - IEEE
22. Chakraborty, Rajat Subhra, Member - IEEE

Member - Editorial Board

1. Chakrabarti, Partha Pratim (0) Member - Journal of IETE
2. Chakrabarti, Partha Pratim (0) Member - Journal of the Computer Society of India

Awards & Honours

1. Mukhopadhyay, Debdeep (2013) Award from M/S Intellectual Ventures based on reviewer scores for an invention proposal Architecture specific high-speed block cipher implementation
3. Chakraborty, Rajat Subhra (2012) Cash Award from M/S Intellectual Ventures based on reviewer scores for an invention proposal titled Multi-level Inline Data Deduplication
4. Dasgupta, Pallab (2012) IESA Technomentor Award

Fellowships

1. Dasgupta, Pallab (2013) Fellow of Indian National Academy of Engineering

Sponsored Research Projects
1. 3-D Image Sensor for Capturing Minute Surface Details and Visualization by Geometric Modeling (DST, Rs.33.00 Lakhs)
2. Aakash development laboratory at IIT Kharagpur (MHRD, Rs.0.00 Lakhs)
3. An Open Source Web Browser for Blind People (DIT, Govt. of India, Rs.29.94 Lakhs)
4. Anwesan: A Search engine for Bengali literary works (SNLTR, Rs.10.00 Lakhs)
5. AUTOSAFE -- Architecture Aware Timing Analysis and Optimization of safety Critical Automotive Software (IGSTC, Rs.291.12 Lakhs)
6. Building Collaborative Download Framework for Wired and Wireless Networks (DST, Rs.42.00 Lakhs)
7. Building Delay Tolerant Peer-to-peer network (DIT, Rs.55.00 Lakhs)
8. Building Reliable Embedded Real-Time Systems (DST-Indo Brazil Project, Rs.33.66 Lakhs)
9. Creating Accessible Study Materials for Print Impaired Students (MHRD, Rs.53.00 Lakhs)
10. Cross language information accessil Phase II (Ministry of Communications and Infromation Technology, Rs.138.73 Lakhs)
11. Deployment of telemedicine project (II) - DOTP (WEBEL Electronic Communications Systems Ltd., Rs.0.00 Lakhs)
12. Design and Analysis of a Light Weight Cryptographic System on FPGAs (ISRO India, Rs.9.12 Lakhs)
13. Design and Analysis of Side Channel Attack resistant symmetric Key Cryptosystems (Department of Science & Technology, New Delhi, Rs.9.24 Lakhs)
14. Design and development of integrated security risk management for an enterprise network (Department of Information Technology, Govt of India, Rs.48.00 Lakhs)
15. Design of an Integrated Scheme for Error Correction and Message Authentication, (SAC Ahmedabad, KCSTC IIT Kharagpur, Rs.6.00 Lakhs)
16. Design of Finite Field Controller (CAIR DRDO, Rs.0.00 Lakhs)
17. Design of Side Channel Attack Resistant Programmable Block Ciphers on FPGAs (DIT India, Rs.73.20 Lakhs)
18. Development of a Web-enabled e-Healthcare System for Neonatal Patient Care Services (eNPCS) (PCS) (MCIT, Govt. of India, Rs.39.70 Lakhs)
19. Development of Bangla Linux and Standardized Bangla Keyboard (Society for Natural Language Technology Research, Rs.7.50 Lakhs)
20. Development of Elliptic Curve Hardware Engine on Reconfigurable Platform (CAIR, DRDO, Bangalore, Rs.6.96 Lakhs)
21. Development of spatio-temporal access control models (Department of Science and Technology, Govt. of India, Rs.16.18 Lakhs)
22. Development of Web enabled e-Healthcare System for Neonatal Patient Care Services (eNPCS) (Department of Information Technology, Government of India, Rs.39.70 Lakhs)
23. Encryption – Encryption in Compressed Domain, (SAC Ahmedabad, (KCSTC IIT Kharagpur), Rs.12.00 Lakhs)
24. Enhancing Cloud Efficiency through P2p Based Architecture (CSIR, Rs.24.00 Lakhs)
25. Extending the Scope of Equivalence Checking in Complex Embedded System Design Verification (DST, Rs.840000.00 Lakhs)
26. Fault diagnosis in digital systems (under Synopsys CAD Lab) (Synopsys India, Rs.40.00 Lakhs)
27. GM Collaborative Research Laboratory on ECS for Education (General Motors, Rs.184.00 Lakhs)
28. Hardware Security: Ensuring TRUST in Integrated Circuits (SRC, IIT Kharagpur, Rs.5.00 Lakhs)
29. ICT for computational social science (DST, Rs.1380000.00 Lakhs)
30. Image analysis for preservation and archiving of Indian Cultural Heritage (DST, Rs.23.00 Lakhs)
31. Indian Language Machine Translation Phase II (Ministry of Communications and Infromation Technology, Rs.40.00 Lakhs)
32. Integrated Vehicle Health Management for Automotive Engine Applications (NPMASS, Rs.259.60 Lakhs)
33. Intel Embedded Innovation Lablet (Intel India, Rs.12.00 Lakhs)
34. Intel Embedded Innovation Lablet (Intel, Rs.12.00 Lakhs)
35. Investigation of Cryptanalytic Techniques (Headquarters, Integrated Defence Staff, Ministry of Defence, Govt of India, Rs.44.30 Lakhs)
36. Leveraging Bipartite network to investigate the dynamical properties of socio-technical systems (Samsung GRO, Rs.4000000.00 Lakhs)
37. Leveraging Simulation Dumps and Failure Traces for Formal Property Verification (INTEL Technology India Pvt. Ltd, Bangalore, Rs.10.00 Lakhs)
38. Linux kernel development and support (Nucleodyne Systems Inc., USA, Rs.12.00 Lakhs)
39. Machine Learning based Model-building Attack on PUFs (Centre for Artificial Intelligence and Robotics (CAIR), Defence Research and Development Organisation, Rs.9.60 Lakhs)
40. Modeling and Validation of Interlocking for Railway Signalling Systems (Ministry of Railways, Rs.34.60 Lakhs)
41. New perspectives for computational social science (DST, India and Ministry of External Affairs, Italy, Rs.2.00 Lakhs)
42. Optimal solutions and applications for the next generation wireless Internet. (VEICET, Rs.45.00 Lakhs)
43. Pattern Recognition Algorithms for Bioinformatics (DST, Rs.24.50 Lakhs)
44. POWER ATTACKS ON STREAM CIPHERS AND CACHE MEMORY ATTACKS (DRDO New Delhi, Rs.45.00 Lakhs)
45. Preprocessing and Analysis of Degraded Documents (MCT, GOI, Rs.34.00 Lakhs)
46. Programming and Data Structures Virtual Lab (MHRD, Rs.20.00 Lakhs)
47. Regression Testing of Object-Oriented Programs (DST, New Delhi, Rs.10.54 Lakhs)
48. Safety messaging in vehicular networks (General Motors India, Rs.0.00 Lakhs)
49. SocioWeb: Social computation to enhance Web and network applications (ISIRD, SRIC IIT Kharagpur, Rs.5.00 Lakhs)
50. Software Tools for Cryptanalysis of Stream Cipher (SAG, DRDO, New Delhi, Rs.19.85 Lakhs)
51. Special Manpower Development Project (DIT, Rs.90.00 Lakhs)
52. Speech Based Computer Interface (Intel, Rs.10.00 Lakhs)
53. Strategies for power reduction during VLSI circuit testing (DIT, Government of India, Rs.31.00 Lakhs)
54. Study of Hardware Malware Vulnerabilities and Mitigation Techniques for FPGAs (completed) (Centre for Artificial Intelligence and Robotics (CAIR), Defence Research and Development Organisation, Rs.9.00 Lakhs)
55. Understanding, Leveraging and Deploying Online Social Networks (DST-IMPECS, Rs.60.00 Lakhs)
56. Virtual Lab (VLS) on Computer Organization (MHRD, Rs.56.00 Lakhs)
57. Virtual Lab for Computer Organisation & Architecture (MHRD, Rs.56.00 Lakhs)
58. VLSI Design of Elliptic Curve Cryptosystem tolerant Against Power Attacks (SRIC, IIT Kharagpur, Rs.4.40 Lakhs)

Consultancy Projects

1. Analytics of Group Dynamics of Mobile Users (Xerox Corporation, Rs.79.20 Lakhs)
4. Architecture and Algorithmic Optimizations for Speech based Communication Interfaces on Mobile Devices (Intel India, Rs.57.00 Lakhs)
5. Cache Timing Attack on Clefia (NTT Labs, Japan, Rs.20.00 Lakhs)
6. Core Banking for OSCB (OSCB, Rs.50.00 Lakhs)
7. Core Banking Systems Implementation (Orissa State Cooperative Bank Ltd., Bhubaneswar, Rs.56.25 Lakhs)
8. Design of PSEC-KEM (NTT Labs, Japan, Rs.9.40 Lakhs)
9. Design of PSEC-KEM algorithm on prime fields (NTT Labs, India, Rs.20.00 Lakhs)
10. Drafting Revised Guidelines for UG Engineering Program Accreditation (NBA, Rs.0.00 Lakhs)
11. Formal Equivalence and Simulation Relations for AMS Behavioral Models (Semiconductor Research Corporation, USA, Rs.45.00 Lakhs)
12. Formal methods for power intent verification (MPIV) (Synopsys (India) Pvt. Limited, RMZ Infinity, Tower A, Old Madras Road, Bangalore-560016, Rs.25.00 Lakhs)
13. Formal Verification of Post Silicon Bug Fixes (INTEL Technology India Pvt. Ltd, Bangalore, Rs.22.06 Lakhs)
14. General Motors ECS CRL Projects (General Motors, Rs.60.00 Lakhs)
15. GM Collaborative Research Laboratory on Electronics, Controls and Software: Projects (General Motors, Rs.425.00 Lakhs)

16. HARDWARE TROJAN ATTACK TEST BED ON FPGA BASED SYSTEMS (Reconnoiter Technology & Research Pvt. Ltd, Rs.20.00 Lakhs)

17. Hardware Trojan Attack Testbed on FPGA based Systems (Reconnoiter Technology and Research, Pune, India, Rs.20.00 Lakhs)

18. IT Consultancy (CITM) (UCO Bank, Rs.15.00 Lakhs)

19. IT Consultant at NIC (National Insurance Company Limited, Rs.3.12 Lakhs)

20. Platform Architecture Modeling for Exploring Power Management Strategies (Intel, Rs.16.00 Lakhs)

21. Roadmap for ERP Solutions at Kolkata Port Trust (Kolkata Port Trust, Rs.4.50 Lakhs)

22. Sanyog Phase II: A portable communication Tool for the Speech & Neuro Motor Impaired People (Media Lab Asia, New Delhi, Rs.71.12 Lakhs)

23. SIDE-CHANNEL ATTACK (SCA) EVALUATION OF PSEC-KEM (NTT Labs Japan, Rs.14.20 Lakhs)

24. Synopsys CAD Laboratory (Synopsys, Rs.172.72 Lakhs)

25. Technical Consultancy Services on IT Matters (UCO Bank, Kolkata, Rs.6.00 Lakhs)

**Technology Transferred**

1. CAIR, DRDO - ECC Processor : Rs. 6.96 Lakh

**Patents (filed / granted)**

1. A cache Timing Attack resistant Prefetching Architecture
2. Architecture for Processing Fingerprint Images
3. Architecture specific high-speed block cipher implementation
4. Method and Apparatus for Extracting Assume Properties
5. Method and Apparatus for Operational-Level Functional and Degradation Fault Analysis
6. Method and Apparatus for Providing a Binary Fingerprint Image
7. Method and Apparatus to Reduce False Minutiae from a Binary Fingerprint Image
8. Method and apparatus to reduce false minutiae from a binary fingerprint image
9. MULTI-LEVEL INLINE DATA DEDUPLICATION
10. PROTECTION OF INTELLECTUAL PROPERTY (IP) CORES THROUGH A DESIGN FLOW
11. Shruti: Vernacular Speech Recognition System in Bengali

**Visits Abroad by Faculty Members**

2. Mukhopadhyay, Debdeep - Research fellow (funded with fellowship from IUSTF-2012) (NYU-Poly, USA, ) 3 months
3. Mukherjee, Animesh - Organizing Dynamics on and of Complex Networks - V (Vienna, Austria, ) September 12-16
4. Mukherjee, Animesh - Invited talk (Dresden, Germany, ) 13-19 May
5. Chakraborty, Rajat Subhra - To deliver keynote speech in IEEE WRTLT12 workshop (Niigata, Japan, ) 18-25 November 2012
6. Mukhopadhyay, Debdeep - Presented Paper at CHES 2012 (K.U Leuven, Belgium, ) 4 days
8. Chakraborty, Rajat Subhra - To deliver an invited keynote speecg at the 2011 IEEE WIFS workshop (Foz do Iguacu, Brazil, ) 27th November 2011 to 2nd December 2011
9. Mukhopadhyay, Debdeep - Presentation for Project Collaboration (Telecom ParisTech, France, ) 1 day
10. Mukhopadhyay, Debdeep - Presented Paper at DTIS 2013 (Abu Dhabi, ) 4 days
12. Mukhopadhyay, Debdeep - Invited talk for Shannon Fellowship Colloquium (TU Darmstadt, Germany,)
13. Mukhopadhyay, Debdeep - Tutorial on Hardware Security (IEEE WIFS, Brazil,)
14. Roychowdhury, Dipanwita - To attend conference ACRI 2012 (Santorini Greece, ) September 24 - 27
16. Sarkar, Sudeshna - Invited to attend Microsoft faculty summit (Redmond, USA, ) July 15 - 17, 2012
17. Sarkar, Sudeshna - To present paper in UMAP 2012 (Montreal, Canada, ) July 18-20, 2012
18. Mukherjee, Animesh - Invited talk (Frankfurt, Germany, ) May 2012
20. Mukherjee, Animesh - Invited talk (Frankfurt, Germany, ) December 2012

Invited Lectures by Faculty Members

1. Statistical physics of language dynamics by Mukherjee, Animesh (IMSC, Chennai)
2. Opinion formation on time-varying social networks by Mukherjee, Animesh (MPI-PKS, Dresden, Germany)
3. Opinion formation on time-varying social networks by Mukherjee, Animesh (Technical University of Darmstadt, Germany)
4. From naming to color naming by Mukherjee, Animesh (Goethe University, Frankfurt, Germany)
5. From naming to color naming by Mukherjee, Animesh (ISI Kolkata)
6. From naming to color naming by Mukherjee, Animesh (S. N. Bose National Center for Basic Sciences, Kolkata)
7. Opinion formation through language games by Mukherjee, Animesh (IIT Kharagpur (IMPECS Workshop))
8. Algorithms for computational social science by Mukherjee, Animesh (INAE Annual Convention, CBRI, Roorkee)
9. Opinion formation through language games by Mukherjee, Animesh (Goethe University, Frankfurt, Germany)
10. Shift of research interest in Computer Sciences over the last 50 years: What citation analysis refle by Mukherjee, Animesh (Heritage Institute of Technology, Kolkata)
11. Digital Color Restoration of Heritage Murals by Mukhopadhyay, Jayanta (Bangalore)
12. Digital Image Analysis of Stone Inscriptions by Mukhopadhyay, Jayanta (Bangalore)
13. Digital distances and their applications in image processing by Mukhopadhyay, Jayanta (Bangalore)
14. Gait Recognition by Mukhopadhyay, Jayanta (Tumkur)
15. Extraction of contextual information from Echo-Cardiogram Video by Mukhopadhyay, Jayanta (Mumbai)
16. Telemedicine For Public Health: A Retrospective by Mukhopadhyay, Jayanta (Kolkata)
17. Telemedicine Projects in West Bengal and Tripura: A retrospective by Mukhopadhyay, Jayanta (Bhubaneswar)
18. Testing Techniques for Hardware Trojan Detection at IEEE WRTLT 2012 Workshop by Chakraborty, Rajat Subhra (Niigata, Japan)
19. Reversible Watermarking (tutorial) at ICISS 2012 Conference by Chakraborty, Rajat Subhra (Guwahati, India)
20. Parallel Computational Lithography by Das, Partha Pratim (Workshop on “Selected Topics in Computer Science??, Heritage Institute of Technology, Kolkata, Jul. 12-13, 2012)

24. Reasoning with Formal Specifications by Dasgupta, Pallab (Tech. Univ of Munich, Germany)

25. Formal Verification in Informal Worlds by Dasgupta, Pallab (Embedded Tutorial at ISED 2012, Kolkata)

26. Formal Verification in Informal Worlds by Dasgupta, Pallab (Chennai Mathematical Institute)

27. How secured the Cryptosystems are on FPGA Platform by Roychowdhury, Dipanwita (University of Calcutta, Kolkata)

28. Cellular Automata and Cryptography by Roychowdhury, Dipanwita (Bengal Engineering and Science University, Kolkata)

29. Design of Symmetric Key Cryptography by Roychowdhury, Dipanwita (D.M. College of Science, Manipur)

30. Robust audio watermarking schemes for secure sharing of audio files by Sengupta, Indranil (Tezpur University)

31. Side Channels in Cryptography by Mukhopadhyay, Debdeep (IIT Madras (SPACE 2012))

32. Information Security from a Hardware Perspective by Mukhopadhyay, Debdeep (WIFS 2011, Brazil)

Books Published


Short-Term Courses, Training Programmes and Workshops organised

1. Micro Controller & Embedded Systems (5 Days)

2. Spec2Layout Training Programme (10 weeks (13-08-2012:19-10-2012))

Papers Published in Journals


2. A Fault Analysis Perspective for Testing of Secured SoC Cores By Subidh Ali, Bodhisatwa Majumdar, Debdeep Mukhopadhyay IEEE Design & Test (0)


6. A Robust Method for Ventriculomegalay Detection from Neonatal Brain Ultra Sound Images
   By P. Mondal, J. Mukherjee, S. Sural, A. K. Majumdar, B. Majumdar, S. Mukherjee, A. Singh
   Journal of Medical Sciences Vol. 36, 2817-2828 (2012)

7. Algorithms for computing diffuse reflection paths in polygons
   By Subir Kumar Ghosh, Partha Pratim Goswami, Anil Maheshwari, Subhas Chandra Nandy, Sudek Kumar Prasant Pal, Swami Sarvattomananda
   The Visual Computer 28(12), 1229-1237 (2012)

8. Algorithms for Generating Ordered Solutions for Explicit AND/OR Structures
   By Priyankar Ghosh, Amit Sharma, P. P. Chakrabarti, Pallab Dasgupta

9. An embedded system for aiding navigation of visually impaired persons
   By A. Kumar, R. Patra, M. Mahadevappa, J. Mukhopadhyay, and A.K. Majumdar

10. An IR-based Evaluation Framework for Web Search Query Segmentation
    By Rishiraj Saha Roy, Niloy Ganguly, Monojit Choudhury, Srivatsan Laxman
    ACM SIGIR (2012)

11. Analysis of Adductors Angle Measurement in Hammersmith Infant Neurological Examinations Using Mean Shift Segmentation and Feature Point Based Object Tracking
    By D. P. Dogra, A. K. Majumdar, S. Sural, J. Mukherjee, S. Mukherjee, A. Singh

12. Approximate Partitioning of 2D Objects into Orthogonally Convex Components
    By M. Dutt, A. Biswas, and P. Bhowmick
    Computer Vision and Image Understanding 117(4):326-341 (2013)

    By Subhankar Mukherjee and Pallab Dasgupta

14. Block DCT to Wavelet Transcoding In Transform Domain
    By K. Viswanath, J. Mukherjee, and P. K. Biswas

15. Boosting Profiled Cache Timing Attacks With Apriori Analysis
    By Chester Rebeiro, Debdeep Mukhopadhyay
    IEEE Transactions on Information and Forensics Security (IEEE TIFS) 7(6), 1900-1905 (2012)

16. Branch Target Buffer Energy Reduction Through Efficient Multiway Branch Translation Techniques
    By Sumanta Pyne, Ajit Pal

17. CAR30: A new scalable stream cipher with rule 30
    By Sourav Das, Dipanwita Roy Chowdhury

    By Sandip Karmakar, Debdeep Mukhopadhyay, Dipanwita Roy Chowdhury

19. Circular Arc Segmentation by Curvature Estimation and Geometric Validation
    By S. Pal, R. Dutta, and P. Bhowmick.
    International Journal of Image and Graphics Accepted (2012)

20. Cognos: Crowdsourcing Search for Topic Experts in Microblogs
    By Saptarshi Ghosh, Niloy Ganguly, Naveen Sharma, Fabio Benevenuto, Krishna Gummadi
    ACM SIGIR (2012)

21. Cohesive Coverage Management: Simulation Meets Formal Methods
    By Aritra Hazra, Priyankar Ghosh, Pallab Dasgupta and P. P. Chakrabarti

22. Computational intelligence in software cost estimation: an emerging paradigm
    By Tirumala Rao Benala, Satchidananda Dehuri, Rajib Mall

23. Computing Minimal Debugging Windows in Failure Traces of AMS Assertions
    By Subhankar Mukherjee and Pallab Dasgupta

24. Correlations in complex networks under attack
    By A. Srivastava, B. Mitra, N. Ganguly, F Peruani,  F Peruani

25. Cryptosystem for secret sharing scheme with hierarchical groups
    By Atanu Basu, Indranil Sen Gupta and Jamuna Kant Sing

26. Design of a high performance Binary Edwards Curve based processor secured against side channel analysis
    By Ayanjika Chatterjee and Indranil Sengupta
    Integration, the VLSI Journal 45(3):331-340 (2012)

27. Design, Analysis of Cryptographic Algorithms and their Implementations
    By Debdeep Mukhopadhyay
    Annals of INAE 2011 (0)
42. Hyperspheres of Weighted distances in arbitrary dimension  By J. Mukherjee  Pattern Recognition Letters 34 (2), 117-123  (2013)
47. Post-Silicon Debugging of PMU Integration Errors using Behavioral Models  By Antara Ain, Subhankar Mukherjee, Pallab Dasgupta and Siddhartha Mukhopadhyay  Integration, the VLSI Journal  (2012)
51. Secured hierarchical secret sharing using ECC based signcryption By Atanu Basu, Indranil Sen Gupta and Jamuna Kant Sing Security and Communication Networks 752-763 (2013)

Papers Presented in Conferences

6. An approach to solve tracking and message blocking problems in RFID, By Subhasish Dhal, Ajay Kant Singh and Indranil Sen Gupta, 4th International Conference on Communications Security and Information Assurance (CSIA), New Delhi, India, (2013)
7. An ATE assisted DFD technique for volume diagnosis of scan chains, By Subhadip Kundu, Santantu Chattopadhyay, Indranil Sen Gupta and Rohit Kapur, 50th Design Automation Conference, Austin, TX, USA, (2013)


22. Assessment of Vascular Health using Photoplethysmograph and a Two-Pulse Synthesis Model for Patients under Hemodialysis with End Stage Renal Disease, By Dharitri Goswami, Jayanta Mukhopadhyay and Koel Chaudhury, Indian Conference on Medical Informatics and Telemedicine (ICMIT-2013), Kharagpur, India, (2013)


30. Design and implementation of rotation symmetric S-boxes with high nonlinearity and high DPA resilience, By Bodhisatwa Mazumdar, Debdeep Mukhopadhyay and Indranil Sen
Gupta, *6th International Symposium on Hardware-Oriented Security and Trust (HOST)*, Austin, TX, USA, (2013)


71. Pushing the Limits of High-Speed GF(2^m) Elliptic Curve Scalar Multiplication on FPGAs, By Chester Rebeiro, Sujoy Sinha Roy, Debdeep Mukhopadhyay, CHES, Leuven, Belgium, (2012)


85. User based Collaborative Filtering with Temporal Information for Purchase Data., By Maunendra Sankar Desarkar, Sudeshna Sarkar, KDIR 2012, 4th Intl Conference on Knowledge Discovery and Information Retrieval, Barcelona, Spain, (2012)


Department of Electrical Engineering

Head
Prof. Jayanta Pal

Professors
Barua, Alok  Ph.D.(IIT Kharagpur), BIST for Pipelined ADC Fault Diagnosis of Analog and Mixed Signal Circuit In-Situ Measurement
Bhattacharya, Tapas Kumar  Ph.D.(IIT Kharagpur),
Das, Sarit Kumar  Ph.D.(IIT Kharagpur), Control Systems
Dutta, Pranab Kumar  Ph.D.(IIT Kharagpur), Biomedical Image Processing, Signal processing, Optoelectronics
Kastha, Debaprasad  Ph.D.(Tennessee), Wind Electrical Systems, Switched Mode Power Supplies, Machine Drives
Kishore, N K  Ph.D.(IISc Bangalore), High Voltage and Insulation Engg., Renewable Energy, Power System Transients
Maka, Srinivasu  Ph.D.(IIT Kharagpur), Biomedical System Engineering, Control Systems & Instrumentation Engineering
Mohan, Bosukonda Murali  Ph.D.(IIT Kharagpur), Computational Intelligence in Control Systems, Orthogonal Functions Applications in Control Systems, Control Systems
Patra, Amit  Ph.D.(IIT Kharagpur), Power Management Circuits, VLSI Design, Fault Tolerant Control
Pradhan, Ashok Kumar  Ph.D (Sambalpur Univ.), Power System Protection - Wide Area Measurement System- Smart Grid- Applied Signal Processing
Ray, Goshaidas  Ph.D.(IIT Delhi), Robust Stabilization, Time-Delay System, Decentralized Control and State Estimation:, Intelligent Control., Network control System
Routray, Aurobinda  Ph.D.(Sambalpur Univ), Cognitive Modelling and Human Monitoring, Embedded Systems Design for Real Time Signal and Image Processing, Data Driven Diagnostics and Prognostics
Sen Gupta, Sabyasachi  Ph.D.(IIT Kharagpur),
Sen, Siddhartha  Ph.D.(IIT Kharagpur), Fractional Order Systems, MEMS Capacitive Accelerometer, Control Allocation
Sinha, Avinash Kumar  Ph.D.(Pilani), Electrical Power Systems
**Associate Professor**

Poddar, Gautam  
*Ph.D.(IISc Bangalore)*, Medium voltage converter with high frequency isolation

**Assistant Professors**

Bajpai, Prabodh  

Bhattacharya, Tanmoy  
*Ph.D.(IISc. Bangalore)*, Power Converters and Machine Drives

Biswas, Karabi  
*Ph.D.(IIT Kharagpur)*, Sensor Design, Development of Instrumentation System, Study of Fractional Order Systems

Chatterjee, Dheeman  
*Ph.D.(IIT Kanpur)*, Power System Dynamics, Grid Integration of Renewables, FACTS controllers

Chattopadhyay, Souvik  
*Ph.D (IISc. Bangalore)*, Digital Control of Power Converters, Soft-switched dc dc converters

Deb, Alok Kanti  
*Ph.D.(IIT Delhi)*, Control Systems, Computational Intelligence

Kapat, Santanu  

Mukherjee, Anirban  
*Ph.D. (IIT Kharagpur)*, Computational Biology, Biomedical Signal Processing

Patra, Sourav  
*Ph.D.(IIT Kharagpur)*, Robust control, Nonlinear control

Saritha, B  
*Ph.D.(IIT Madras)*, Grid integration of renewable sources, Electrical machines and drives

**Brief Description of on-going activities**

From classical to modern, from milli watts to tens of kilo watts, from conventional to non-conventional, the electrical engineering department investigates these all. The range of investigation for this department is one of the broadest in this institute. The major on going activities are categorized as follows: Machine Drives and Power Electronics: * Magnetic Levitation * Superconducting magnetic energy storage * Variable frequency AC-Drives * Simulation of power electronic circuits * Resonant Converters * Design of integrated circuits for Power Management * Nonlinear phenomena in Power Electronics * Automotive Electronics * Diagnostic of drives * Drive fatigue analysis Control and Dynamic Systems: * Neuro-fuzzy controllers * Control of chaotic systems * Discrete event and hybrid systems * Fault-tolerant control of aero-space systems * Attitude control of satellites and launch vehicles * Robust stabilization using periodic controllers * Reduced order modeling * Control of Variable Air-Volume Air-Conditioning Systems * Bifurcation theory of hybrid dynamical systems * Delta domain digital control analysis and design * Neural networks applications in control * Genetic algorithm applications in control * Decentralized control of large scale systems * Nonlinear dynamics * Fractional order system and their applications Power and Energy Systems: * Wind turbines * Power system dynamics * Real-time digital simulation of power systems * Power system protection * Intelligent relaying * State estimation of power systems * Condition and Diagnostic Monitoring of Power Apparatus * Energy audit and management * Power system planning and optimisation * Wavelet Application to Power system Transients * Neural Net Application to Partial Discharge Phenomenon * Electric Field Computations, Lightning Protection, Material Characterization * FACTs Instrumentation and Signal Processing: * Laser based profile measurement * Image based measurement systems * Motion estimation using MRI and colour Doppler imaging * Non-Linear and Statistical Signal Processing * Real Time Algorithms for Detection and Diagnostics * Condition monitoring of machines and power apparatus * Testing of analog and digital VLSI circuits * Fault detection and diagnosis of analog circuits * Control and instrumentation of bio-reactors * Fibre-optic
components and sensors * Biomedical signal processing * Analysis of ECG signals * Sensors fusion * Multimedia Security * Convex Optimization and LMI applications to Signal Processing * Design and development of MEMS accelerometer * Seismic signal processing, active noise control * Fast algorithms for real time signal processing

**Thrust Areas**

1. This department has identified the following topics as the thrust areas of investigations:

**International Collaborations**

Collaboration is going on through DST, India, and Research Council UK (RCUK) supporting a project on Stability and Performance of Photovoltaics. This is a joint collaboration involving IIT Bombay, IIT Kanpur, IIT Kharagpur and Solar Energy Centre, New Delhi from India, and Imperial College, London, Loughborough University, Northumbria Photovoltaics Application Centre (NPAC), Northumbria University, Strathclyde University from UK.

**Lectures by Visiting Experts**

1. Matrices applied to Signal Systems and Control by Prof. Biswa N. Datta (Distinguished Research Professor, Northern Illinois University, USA)
2. Cyber-Physical World: A Perspective from Pervasive Computing and Smart Environments by Dr. Sajal K. Das (University Distinguished Scholar Professor Director, Center for Research in Wireless Mobility and etworking(CReWMaN) Department of Computer Science and Engineering, The University of Texas at Arlington, USA)
3. Zero-sum Risk-sensitive Stochastic Differential Games by Dr. Arnab Basu (Associate Professor, IIM Bangalore)
4. Subspace Projection based analysis of Stressed Speech by Dr. Samarendra Dandapat (Professor, Electronics & Electrical Engg. (EEE) Dean Administration, IIT Guwahati)
5. Wide-Area Modeling, Monitoring and Control of Large Power Systems Using Synchronphasors by Dr. Aranya Chakraborty (Assistant Professor, Department of Electrical Engg, North Carolina State University, USA)
6. Electronics in Aerospace Systems by Prof P R Mahapatra (Department of Aerospace Engineering, IIsc, Bangalore)
7. Drives & Automation by Dr. Samsul Ekram (Sr. Manager, CG Global R&D Centre, Crompton Greaves Ltd, Mumbai)

**Doctoral and MS Degrees Awarded**

1. Raj Kumar Biswas : Fractional Optimal Control Problems(Ph.D)
2. Sibsambhu Kar : Analysis of Electroencephalograph Signals for Detecting Fatigue in Human Drivers(Ph.D)
4. Anirban Krishna Bhattacharyya : Estimation of Signal Models for Aerospace and Industrial Applications(MS)
5. Antara Ain : Validation and debugging of integrated circuits using behavioral models(MS)
7. M Shahin : Modeling, Analysis and Control of Long Term Arterial Blood Pressure Regulation System(Ph.D)
8. Malaya Kumar Sahu : Hybrid Converter Based Shunt Active Compensators For Medium Voltage Applications(Ph.D)
Member - Professional Bodies

1. Chakraborty, Chandan, Senior Member - IEEE
2. Chakraborty, Chandan, Member-at-large - IEEE Industrial Electronics Society
3. Pradhan, Ashok Kumar, Senior Member - IEEE, USA
4. Pradhan, Ashok Kumar, Life member - Indian Society Of Tecnical Education (ISTE)
5. Mukherjee, Anirban, Member - IEEE
6. Chatterjee, Dheeman, Member - IEEE
7. Deb, Alok Kanti, Regular - IEEE
8. Biswas, Karabi, Regular - IEEE
9. Biswas, Karabi, Member - IEEE
10. Biswas, Karabi, - System Society of India
11. Biswas, Karabi, Regular - System Society of India
12. Bajpai, Prabodh, Associate Member - The Institution of Engineers (India)
13. Bajpai, Prabodh, Member - IEEE, USA
14. Saritha, B, Member - IEEE
15. Bhattacharya, Tanmoy, Member - IEEE
16. Kapat, Santanu, Member - IEEE
17. Sinha, Avinash Kumar, Member - IEEE, USA
18. Sen, Siddhartha, Member - IEEE
19. Barua, Aloke, Senior Member - IEEE
20. Barua, Aloke, Life Member - System Society of India
21. Patra, Amit, Member - IEEE
22. Pal, Jayanta, Life Member - Systems Society of India
23. Mohan, Bosukonda Murali, Member - Asian Control Association
24. Mohan, Bosukonda Murali, Member - IFAC (International Federation of Automatic Control) Technical Committee on Computational Intelligence in Control
25. Mohan, Bosukonda Murali, Life Member - Systems Society of India
26. Mohan, Bosukonda Murali, Senior Member - IEEE (USA)
27. Mohan, Bosukonda Murali, Member - Automatic Control and Dynamic Optimization Society
28. Mukhopadhyay, Siddhartha, Life member - System Society of India
29. Mukhopadhyay, Siddhartha, Member - IEEE
30. Mukhopadhyay, Siddhartha, Member - National Committee on IVHM
31. Kishore, N K, Senior - IEEE
32. Kishore, N K, Life Member - System Society of India
33. Dutta, Pranab Kumar, Member - IEEE
34. Kastha, Debaprasad, Regular - IEEE
35. Routray, Aurobinda, Member - SIAM, USA
36. Routray, Aurobinda, Member - IEEE, USA

Member - Editorial Board

15. Mohan, Bosukonda Murali (2013) Member - Advances in Fuzzy Systems
19. Patra, Amit (0) Member, Editorial Board - International Journal of Electrical Engineering Education
22. Sinha, Avinash Kumar (2007) Member, Board of Advisors - The ICFAI Journal of Science and Technology

Awards & Honours

2. Sinha, Avinash Kumar (2010) IBM Open Collaborative Faculty Award

Fellowships

1. Mukherjee, Anirban (2012) BOYSCAST

Sponsored Research Projects

1. A Study of the Impacts of Increased Penetration of Wind Power on Power System Stability (DST, India, Rs.19.00 Lakhs)
2. Advanced Control and Failure Prognosis and Diagnosis of Industrial Processes for Steelmaking Using Data Fusion-Phase I. (completed) (DIT, New Delhi, Rs.58.92 Lakhs)
3. Artificial Heart Development Programme- Phase II (HDP) (DST, New Delhi, Rs.25.24 Lakhs)
4. AVLSI Consortium (Multiple Organisations in India and Abroad, Rs.200.00 Lakhs)
5. Centre for Railway Research (CRR) (Govt. of India, Rs.0.00 Lakhs)
6. DC-AC conversion and grid side paralleling (DST, Rs.60.00 Lakhs)
7. DC-DC conversion for solar PV including MPPT & battery charge controller (DST, Rs.80.00 Lakhs)
8. Design & Feasibility Study of Versatile Low-cost Functional Electrical Stimulator (FES) for Hemiplegics (National Institute for the Orthopaedically Handicapped (NIOH)(Min. of Social Justice & Empowerment., Rs.20.00 Lakhs)
9. Design and Development of an On-board Intelligent Embedded Platform for detection of weak failure modes and prognosis of severe faults in locomotives (Indian Railway, Rs.180.00 Lakhs)
10. Design and Development of an On-board Intelligent Embedded Platform for detection of weak failure modes and prognosis of severe faults in locomotives (Research Design and Standards Organisation (RDSO), Lucknow, Rs.177.33 Lakhs)
11. Design and Fabrication of of SOI based MEMS Accelerometer (DFS) (DST, Rs.30.00 Lakhs)
12. Design of an Embedded System for On-board Assessment of the Level of Alertness in Human Driver (DIT, Rs.39.00 Lakhs)
13. Design of Robust Biochemical Network (CSIR, HRDG, New-Delhi, Rs.11.48 Lakhs)
14. Design, Development and Fabrication of Power Management Integrated Circuits (Tagore Technologies, USA, Rs.5.00 Lakhs)
15. DETECTION AND DIRECTION OF HIGH IMPEDENCE FAULT (DEPARTMENT OF SCIENCE AND TECHNOLOGY, NEW DELHI, Rs.13.00 Lakhs)
16. Developing Fractional Order Circuit Element (Fractance) (SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
17. Development of Electrowetting based Microfluidic device with Controller for Clinical Diagnoses (DBT, Rs.41.45 Lakhs)
18. Development of Electrowetting based Microfluidic device with Controller for Clinical Diagnoses (DBT, India, Rs.50.00 Lakhs)
20. Educational Component of GM Collaborative Research Laboratory (General Motors, Rs.125.00 Lakhs)
21. Fast Fixed Point Algorithms for Identifying Alertness and Emotions (Samsung Advanced Institute of Technology(SAIT) South Korea, Rs.0.00 Lakhs)
22. High Frequency, High Efficiency Hybrid DC-DC Converter (Maxim Corporation, Rs.15.00 Lakhs)
23. IBM Open Collaborative Faculty Award (IBM, Almaden Research centre, USA, Rs.7.00 Lakhs)
24. Identification of Motifs in Integrated Cellular Networks (CSIR, Rs.14.00 Lakhs)
25. Integrated Vehicle Health Management (IVHM) for Automotive Engine Applications under National Programme on Micro and Smart Systems (NPMASS) (On-going) (ADA, Bangalore, Rs.277.30 Lakhs)
26. Intelligent Reservoir Characterization (ONGC, Rs.48.00 Lakhs)
27. Kinematic State Estimation of Multiple Aerospace Targets using Airborne Radar (Completed) (LRDE, DRDO, Bangalore, Rs.9.96 Lakhs)
28. Modelling and design of polymer coated ion selective constant phase element (CPE) sensor (DST, Rs.14.40 Lakhs)
29. National Programme on Micro and Smart Systems (ADA, Bangalore, Rs.259.60 Lakhs)
30. ON-Chip DC-DC converter for PoL application (MAXIM India, Rs.15.00 Lakhs)
31. Online monitoring system for OHE traction parameters (RDSO, Ministry of Railways, Rs.254.02 Lakhs)
32. Online monitoring system for OHE traction parameters (Indian Railways, Rs.249.00 Lakhs)
33. Protecting Power Systems using Wide area measurements (DEPARTMENT OF SCIENCE AND TECHNOLOGY, NEW DELHI, Rs.18.00 Lakhs)
34. Real Time Digital Simulator (TDS) (Centre for Development of Advanced Computing, Trivandrum, Govt. of India, Rs.5.47 Lakhs)
35. Renewable Hybrid Energy Power Plant for Telecom station in Isolated Sites (Vodafone Essar-East Limited, Kolkata, Rs.95.00 Lakhs)
36. Robust Control and Optimization of Power Output from Stand-Alone Wind Energy Conversion Systems for Isolated Telecom Base Stations (Vodafone Essar-IIT Kgp Center of Excellence in Telecommunications (VEICET), Rs.15.00 Lakhs)
37. Setting up an Advanced Facility for Research in Reliability Engineering (On-going) (BARC, Mumbai, Rs.150.00 Lakhs)
38. Speed Sensorless Control of Induction Motor Drive with Limited Switching Frequency and Operation into the Field Weakening Region for Traction Applicat (IIT Kharagpur (ISIRD Project), Rs.5.00 Lakhs)
39. Stability and Performance on Photovoltaics (DST, Rs.163.50 Lakhs)
40. STATCOM with neutral compensation (TCO) (Centre for Development of Advanced Computing, Trivandrum, Govt. of India, Rs.4.00 Lakhs)
41. Testing & characterization of In-House Development of MEMS Capacitive Accelerometer (TCA) (ISRO-IIT Kharagpur Cell, Rs.5.00 Lakhs)
42. Virtual HV Laboratory (MHRD, Rs.60.00 Lakhs)
43. Virtual Lab on Embedded Systems (MHRD, Rs.5.00 Lakhs)
44. Virtual Laboratory on Analog Signals, Networks and Measurement Laboratory (MHRD, Govt. of India, Rs.67.00 Lakhs)

Consultancy Projects

1. A New Application of AMS CAD: Smart Grid, (Synopsys CAD Lab) (On-going) (, Rs.0.00 Lakhs)
2. Active single phase inverter control (SPIC) (Keltron, Trivandrum, Kerala - 695 564, Rs.3.00 Lakhs)
3. Behavioral Modeling and Top-Down Design of Switching Converter ICs (On-going) (National Semiconductor Corporation, USA, Rs.40.00 Lakhs)
4. Bus Paralleling Controller with CAN Interface (CANI) (Centre for Development of Advanced Computing, Trivandrum, Govt. of India, Rs.1.50 Lakhs)
5. Concurrent Virtual Test for Power Converter ICs using Behavioral Modeling (On-going) (National Semiconductor Corporation, USA, Rs.30.00 Lakhs)
6. Data-Driven Methods for Fault Diagnosis and Prognosis using Operating Parameters (General Motors India Science Lab, Rs.0.00 Lakhs)
7. Development of Digital Hardware for M2M Applications (Fountainhead Software Solutions, Rs.2.00 Lakhs)
8. Development of Substation Automation System Phase-I (Monitoring) (Damodar Valley Corporation, Rs.25.70 Lakhs)
9. DISTRIBUTION SYSTEM LOSS CALCULATION AND POSSIBLE IMPROVEMENT (NESCO, BALASORE, ODISHA, Rs.5.00 Lakhs)
10. Estimation of Technical Transmission and Distribution Losses of North Eastern Electricity Supply Company of Orissa Limited (NESCOM Balasore, Orissa, Rs.5.85 Lakhs)
11. Formal Design Intend Modelling and Verification of Mixed Signal Behaviors (On-going) (Semiconductor Research Council (SRC), USA, Rs.0.00 Lakhs)
12. General Motors Collaborative Research Laboratory (General Motors, Rs.375.00 Lakhs)
13. GM-CRL on ECS (Thrust Area Leader) (Completed) (, Rs.0.00 Lakhs)
14. High frequency compensator for high power applications (HPHC) (Veeral Control Pvt. Ltd., Bharat Heavy Electricals (BHEL) Ltd, Rs.2.00 Lakhs)
15. High Voltage Power Supply (Veeral Controls P. Ltd., Rs.4.00 Lakhs)
16. High Voltage Power Supply (HVPS) (Veeral Control Pvt. Ltd. Gandhinagar, Rs.4.00 Lakhs)
17. Lightning Impulse Test on 6.5 MVA, 33/6.6 kV Transformer (Synergy Power Equipment Pvt. Ltd., Jamshedpur, Rs.0.80 Lakhs)
18. Natural Harmonic Compensation of Medium Voltage Converters (NHCM) (C-DAC, Trivandrum, Rs.8.60 Lakhs)
19. On Board Diagnostics of Automotive Engines (completed) (GM-IIT Kharagpur Collaborative Research Laboratory, Rs.500.00 Lakhs)
20. Resonant Frequency Converter II (Megatherm Electronics Pvt. Ltd., Rs.2.00 Lakhs)
21. Sensorless high voltage single phase front-end converter (SHVC) (Signotron India Pvt. Ltd., Kolkata, Rs.2.00 Lakhs)
22. Solar inverter for grid connected and standalone mode with MPPT (MPPT) (Signotron India Pvt. Ltd., Kolkata, Rs.2.50 Lakhs)
23. Universal auxiliary converter for railways rolling stock (UACR) (Indian Railways and C-DAC, Trivandrum, Rs.5.00 Lakhs)

**Patents (filed / granted)**

1. A Real-Time Embedded System for Spark/Arc Detection in Low Voltage Electrical Distribution System
3. A Vision Based Embedded Platform for On-board Assessment of Level of Drowsiness in Human Drivers
4. Fault Tolerant Control for Vector Controlled Induction Motor Drive
5. Single Current Sensor Based Speed Sensorless Vector Controlled Induction Motor Drive
6. State estimation, diagnosis and control using equivalent time sampling

**Visits Abroad by Faculty Members**

1. Chakraborty, Chandan - To attend ADCOM Meeting of IEEE IES and present paper in ISIE 2012 (Hungzhou, China, ) May 28 to June 3, 2012
3. Biswas, Karabi - To present paper in conference (NICE, France, ) 20-08-2012 to 27-08-2012
5. Mukherjee, Anirban - BOYSCAST FELLOWSHIP (TU DARMSTADT, ) 2012
8. Chakraborty, Chandan - To attend ADCOM Meeting of IEEE IES and present paper in IECION 2012 (Montreal, Canada, ) October 23 to November 1, 2012
10. Pradhan, Ashok Kumar - Conference (San Diego, USA, ) one week, July 2012
11. Biswas, Karabi - Research Work (Saarland University, Germany, ) 17th May 2012, 10th July, 2012

Invited Lectures by Faculty Members

1. Renewable integration and energy storage by Bajpai, Prabodh (IMI Kolkata)
2. Hybrid Renewable Energy Systems by Bajpai, Prabodh (Materials Science Centre, IIT Kharagpur)
3. Recent trends in Power system deraegulation by Bajpai, Prabodh (JNTU Kakinada, A.P., India)
4. Hybrid Controller for Renewable Energy Power Plant in Stand-alone sites by Bajpai, Prabodh (India Habitat Centre, Lodhi Road, New Delhi)
5. Synchronisation Measures in Nonlinear Time Series by Routray, Aurobinda (Calcutta University)
6. Field Trial of Analog Signals, Networks and Measurement Virtual Laboratory by Deb, Alok Kanti (Dream Institute of Technology, Kolkata)
7. Field Trial of Analog Signals, Networks and Measurement Virtual Laboratory by Deb, Alok Kanti (VNIT Nagpur)
8. Field Trial of Analog Signals, Networks and Measurement Virtual Laboratory by Deb, Alok Kanti (NIT Raipur)
9. Smart Sensors by Sen, Siddhartha (C V Raman College of Engineering, Bhubaneswar)
10. Smart Sensors by Sen, Siddhartha (Dept. of Radiophysics, Calcutta University)
11. MEMS and Microsystems by Sen, Siddhartha (C V Raman College of Engineering, Bhubaneswar)
12. Wind Power Generator Topologies by Kastha, Deaprasad (Amrita School of Engineering, Coimbatore)
13. Wind Energy system and Control by Kastha, Deaprasad (NIT Rourkela)
14. Prognostics and Health Management (PHM) Conference 2012, by Mukhopadhyay, Siddhartha (GE India Technology Centre, Bangalore)
15. IEEE CSS Symposium (Cyber Physical System: State-of-art and Future Challenges) by Mukhopadhyay, Siddhartha (Bangalore)
16. PROTECTION USING WIDE AREA MEASUREMENTS by Pradhan, Ashok Kumar (IIT KANPUR)
17. Wide Area Measurements BASED Monitoring and Protection by Pradhan, Ashok Kumar (SRM UNIVERSITY CHENNAI)
18. CHANGING POWER SYSTEM SCENARIOS by Pradhan, Ashok Kumar (VSSUT BURLA ODISHA)

Short-Term Courses, Training Programmes and Workshops organised

1. Tata Power Course (2 weeks)

Papers Published in Journals


41. Parallel Connected Shunt Hybrid Active Power Filters Operating at Different Switching Frequencies for Improved Performance By A. Bhattacharya, C.Chakraborty, and S. Bhattacharya IEEE Transactions on Industrial Electronics 59, 4007-4019 (2012)


46. Robust Controller with State-Parameter Estimation for Uncertain Network Control System By Arun K Sharma IET Control Theory and Application vol.6, pp.2775-2784 (2012)


Papers Presented in Conferences


8. A Web Based Analog Signals, Networks and Measurement Laboratory, By Alok Kanti Deb and Tanmoy Dam, Int. Conf. on Soft Computing, Artificial Intelligence, Pattern Recognition, Biomedical Engineering and Associated Technologies (SAP-BEATS), Jodhpur, India, (2013)


23. Flux Programmed Hybrid Mode Operation of a Doubly Fed Induction Generator for Wind Power Application, By S. Mukherjee, D. Kastha, IEEE Int. Conf.on Power Electronics, Drives and Energy Systems, (PEDES), Bengaluru, India, (2012)


33. Robust compensation of discrete-time plant using 2-periodic controller, By S.K. Das and S. Chakrabaoty, Robust control and design, IFAC, Aalborg, Denmark, (2012)

34. Sizing Optimization of PV-FC-Battery System with Hybrid PSO-EO Algorithm, By Ishita Biswas, Vaishalee Dash and Prabodh Bajpai, IEEE INDICON, Kochi, Kerala, India, (2012)

35. SOI MEMS Based Over-Sampling Accelerometer Design with ΔΣ Output, By Dushyant Juneja, Sougata Kar, Procheta Chatterjee, and Siddhartha Sen, VDAT, Shibpur, Howrah, (2012)


Department of Electronics & Electrical Communication Engineering

Head
Prof. Chinmay Kumar Maiti  upto 15.06.2012
Prof. Swapna Banerjee  from 16.06.2012

Professors
Bandyopadhyay, Kalyan Kumar  Ph.D.(Jadavpur University), satellite communication
Banerjee, Swapna  Ph.D.(IIT Kharagpur), VLSI based embedded system design for signal/image processing, Biomedical Instrumentation, Device modeling, Low power circuits, Mixed-signal design
Chakraborty, Ajoy  Ph.D.(IIT Kharagpur), EMI/EMC, Electromagnetics, Antennas
Chakraborty, Mrityunjay  Ph.D.(IIT Delhi), Digital Signal Processing, Adaptive Signal Processing, VLSI Signal Processing, Compressive Sensing
Chattopadhyay, Santanu  Ph.D.(IIT Kharagpur), Network-on-Chip Design and Test, Low Power Digital Testing, Thermal Aware Testing, Fault Diagnosis
Dutta, Debasis  Ph.D.(IIT Kharagpur), Optical Networks, Wireless Networks
Garg, Ramesh  Ph.D.(IIT Kanpur), Electromagnetics
Maiti, Chinmay Kumar  Ph.D.(IIT Kharagpur), Microelectronics, Silicon Heterostructures, Online Laboratories, High-k Gate dielectrics, Memristors, Protein Electronics, Technology CAD, Graphene Electronics
Pathak, Sant Sharan  Ph.D.(IIT Delhi),
Rajakumar, Ratnam Varada  Ph.D.(IIT Kharagpur),
Ray, Ajoy Kumar  Ph.D.(IIT Kharagpur),
Sanyal, Subrata  Ph.D.(IIT Kharagpur),
Sen Gupta, Somnath  Ph.D.(IIT Bombay), Computer Vision, Video Coding

Associate Professors
Bhattacharya, Amitabha  Ph.D.(IIT Kharagpur), RF & Microwave Communication
Bhattacharyya, Tarun Kanti  Ph.D.(Jadavpur Univ), MEMS and Microsystems, RF and Analog VLSI, Thinfilms, Nano- electronics, Nano-scale Biosystems Engineering
Chakrabarti, Indrajit  Ph.D. (IIT Kharagpur), VLSI Design for Image and Video Processing and Communication
Dhar, Anindya Sundar  Ph.D.(IIT Kharagpur), VLSI Architecture Design
Ghosh, Bratin  Ph.D.(Univ. of Manitoba), Applied Electromagnetics
Mahapatra, Sudipta  Ph.D.(IIT Kharagpur), Parallel and Distributed Systems, Image and Video Compression, Optical and Wireless Networks
Mandal, Pradip  Ph.D.(IISc Bangalore), Design Automation of CMOS Analog circuits and Systems, On-chip power management system, Analog Interface circuits for high speed data link, Analog circuits for signal acquisition system
Roy, Rajarshi  Ph.D (Brooklyn Univ.), Communication Networks, Cooperative
Communication, Queuing Theory and Stochastic Processes, Optimization and network control, Performance Evaluation and optimal resource allocation problems, Learning and Self-organization and Emergent Phenomena in random environment, Social Networks, Network Coding, Cognitive Radio, Wireless communication and Geometry

Saha, Goutam
Ph.D. (IIT Kharagpur), Biomedical Signal Processing, Speech Processing, Audio based Surveillance, Biometric Authentication

Assistant Professors
Chakraborty, Paritosh Kumar

De, Arijit
Ph.D. (Syracuse Univ), Electromagnetics, EMI/EMC, RF/Microwave, Digital Signal Processing, Array Processing, Computational Methods

Guha, Prasanta Kumar

Halder, Achintya
Ph.D. (Georgia Tech., Atlanta),

Layek, Ritwik Kumar
Ph.D., Texas A&M Univ., College Station, Genomic Signal Processing/Systems Biology, Digital Image Processing, Linear Control Theory, Computer Vision, Stochastic Process

Mukhopadhyay, Sudipta
Ph.D. (IIT Kanpur), Medical Image and Signal Processing, Content based Medical Image Retrieval, Video Processing, Continuous Authentication

Roy, Rajat
Ph.D. (Univ. of Mumbai), Numerical computation of wave functions

Varshney, Shailendra Kumar
Ph.D. (University of Delhi), Speciality fibers-Photonic crystal fibers, Fiber optic sensors, Fiber devices for next generation communication, Plasmonics, Nanophotonics

Visiting Assistant Professor
Mandal, Mrinal Kanti
Ph.D. (IIT Kharagpur),

Scientific Officer
Sahoo, Ghanashyam
Ph.D (Jadavpur Univ.), EMI effect on Electro Med Devices & Exposer to Mobile Base Station & RF Radiation on Biological Body

Faculty Re-employment
Sudipta Mukhopadhyay
Associate Professor

Brief Description of on-going activities

The following research activities are currently carried out in the department: a) Biomedical Instrumentation: Main thrust is towards the design and development of an embedded system-on-chip solution for an adaptive intelligent biomedical system. Already a low cost Doppler Ultrasonography system has been designed and presently attempt is being made towards design of an Ultrasound Imaging system. For this the architecture for the real time signal processing is being implemented in Xilinx FPGA. Also a non-invasive blood glucose monitor based on laser induced photo acoustic spectroscopy is under development. Another research interest is for early detection of oral cancer via image processing. b) Analog/Mixed Signal Design: Currently the research group is engaged in designing an 8 bit 160 MSPS pipelined 0.25u CMOS ADC and work is also going on the design of an ADC 0.18u BICMOS technology with enhanced performance. c) Communication Systems: Research is being carried out to design a QPSK demodulator and a 9-channel Transmultiplexer for Space application. d) Fibre Optics and Networking: The current research involves dispersion compensation of 40 Gb/s optical transmission system with optical phase conjugation and distributed Raman amplifier as well as with chirped fibre Bragg grating. In the optical networking area, innovative schemes have
been developed for guaranteeing WDM network survivability and IP-over-WDM integrated routing. Work is in progress for development of efficient contention resolution schemes for packet switched optical networks and their analytical modelling. e) Development of a RISC DSP for Modems. f) Development of a dual standard baseband processor for 3G Wireless Systems. g) Data Compression: Work is being carried out for the design of efficient strategies for low bit rate video coding. h) Joint Dispersion and nonlinearity compensation for WDM Transmission systems using Optical Phase conjugation and Distributed Raman Amplifier. i) EMI/EMC: Studies have been performed on different wire antennas (e.g dipole, inverted L, T, I, C-antennas) as Electromagnetic Interference (EMI) sensors. The Method of Moment based numerical technique has been used to evaluate the antenna factor of different wire antennas in different EMI test environments including Gigahertz Transverse Electromagnetic (GTEM) cell. j) Filters: Design, simulation and fabrication of lowpass Microstrip filters with cut-off frequency of 5.0GHz. Bandpass waveguide filters over X and Ku-band of frequencies. X-band filter has passband of 9.50GHz to 10.50GHz and Ku-band filter has passband of 13.90GHz to 14.60GHz. k) MCMT: Multiple Cavity Modeling Technique (MCMT) have been applied to study different waveguide based passive microwave circuits like waveguide diaphragms, filters, power dividers. The technique have also been applied successfully for the radiator problems lime widow radiators, Slot radiators both in transmitting and receiving mode. l) Development of block floating point based schemes for implementing adaptive filters in digital hardware m) Architectural optimization of algorithms for signal processing and wireless communication. n) Formulation of efficient algorithms for designing CMOS operational amplifiers. o) Automated Visual Inspection of Industrial Objects, VLSI Architecture for low bit rate Video Coding, Medical Image Processing, Gesture Recognition from Video Sequences, Face recognition, Content based Retrieval of Texture Images, Fuzzy Neural Network. p) Fault tolerant design of Network on Chip systems. q) Optimal solutions are being developed for the next generation wireless Internet, including intelligent algorithms for implementing vertical handoff, traffic modelling and prediction, design and implementation of rate control algorithm for online video streaming and efficient strategies for implementing flow mobility in MIPv6 protocols.

Thrust Areas

1. MEMS & Semiconductor Technology
2. Broadband Communication Networks
3. VLSI Circuits and Systems

Doctoral and MS Degrees Awarded

1. Gourav Sarkar : Pre-Quantization for Efficient Realization of Automatic Speaker Recognition System and its Real Time Implementation(MS)
2. Tamal Das : Design and Implementation of Embedded Switched-Capacitor DC-DC Converters(MS)
3. Amartya Mazumdar : VLSI Implementation of 2D Mellin Transform for scale Analysis of Images(MS)
4. Deep Bera : Implementation of Digital Scan Conversion and Speckle Reduction Imaging units in DSP for Ultrasound System(MS)
6. Nilanjan Chattaraj : Design of Random Access Analog Memory (RA2M) for Video Application(MS)
7. Ashraf Hossain : Lifetime and coverage studies on wireless sensor networks(PhD)
8. Sumit Kumar Chatterjee : Low power motion estimation algorithms and architectures for efficient video compression(PhD)
9. Kaushik Bhattacharyya : Design and Implementation of Switched Capacitor based Embedded DC-DC Buck Converter(PhD)
10. B. Bala Narsaiah : Enhanced Medium Access Control Protocols for Hybrid IEEE 802.11x - 802.16x Networks and their Performance Analyses(Ph.D.)
11. B. Lakshmi : High Speed VLSI CORDIC Architectures( PhD)
12. Sanjay Kumar Soni : Deterministic Propagation Channel Modeling for Urban Scenario(Ph.D.)
**Member - Professional Bodies**

1. Bhattacharyya, Tarun Kanti, *Member - IEEE*
2. Saha, Goutam, *Regular - IEEE, USA*
3. Roy, Rajarshi, *to be renewed - IEEE*
4. Mahapatra, Sudipta, *Life member - CSI, India*
5. Mahapatra, Sudipta, *Member - IEEE, USA*
6. Mandal, Pradip, *Member - IEEE*
7. Chakrabarti, Indrajit, *Member - IEEE*
9. Mukhopadhyay, Sudipta, *Corresponding Member - RSNA*
10. Mukhopadhyay, Sudipta, *Senior Member - IEEE*
11. Mukhopadhyay, Sudipta, *Member - SPIE*
12. Ghosh, Bratin, *Senior Member - Institute of Electronics and Electrical Engineers (IEEE)*
13. Datta, Raja, *Regular Fellow - OSI*
14. Datta, Raja, *Senior Member - IEEE*
15. Bhattacharya, Amitabha, *Regular - IEEE*
17. Varshney, Shailendra Kumar, *Member - Optical Society of India*
18. Varshney, Shailendra Kumar, *Regular - IEEE*
19. Varshney, Shailendra Kumar, *Member - IEEE*
20. Varshney, Shailendra Kumar, *Member - Optical Society of Americal*
21. Halder, Achintya, *Regular - IEEE*
22. Chakraborty, Ajoy, *Fellow - Institute of Engineers*
23. Chakraborty, Ajoy, *Senior - IEEE*
24. Chakraborty, Ajoy, *Senior - SEMCE(I)*
25. Banerjee, Swapna, *Senior Member - IEEE*
26. Banerjee, Swapna, *Presidents nominee - NIT Council*
27. Garg, Ramesh, *Fellow - IEEE*
28. Dutta, Debasish, *Senior Member - IEEE*
29. Dutta, Debasish, *Life Member - IE*
30. Dutta, Debasish, *Senior Member - IEEE*
31. Sahoo, Ghanashyam, *LIFE MEMBER - EMC SOCIETY OF INDIA (SEMCE- I)*
32. Maiti, Chinmay Kumar, *Senior Member - IEEE*
33. Sanyal, Subrata, *Member - IEEE*
34. Biswas, Prabir Kumar, *Senior Member - Institute of Electrical and Electronics Engineers, USA*
35. Chakraborty, Mrityunjoy, *Senior Member - IEEE*
36. Chakraborty, Mrityunjoy, *Member - IET (formerly IEE, UK)*
37. Sarkar, Binay Kumar, *Life Member - EMC Society of India*
38. Sarkar, Binay Kumar, *Senior Member - IEEE, USA*
39. Bandyopadhyay, Kalyan Kumar, *Fellow - The Institution of Electronics and Telecommunication Engineers*
40. De, Arijit, *Member - IEEE*

**Member - Editorial Board**

2. Chakraborty, Mrityunjoy (2012) *Associate Editor - IEEE Transactions on Circuits and Systems, Part I*
3. Datta, Raja (2011) *Member - International Journal of BioSciences and Technology*
5. Dutta, Debasish (2013) *Editor - IEEE Communications Surveys and Tutorials*

**Awards & Honours**

1. Chakraborty, Mrityunjoy (2012) APSIPA Distinguished Lecturer
2. Chakraborty, Mrityunjoy (2013) APSIPA Distinguished Lecturer
3. Bhattacharyya, Tarun Kanti (2012) IBM Faculty Award
4. Saha, Goutam (2013) In Top 100 of DST Lockheed Martin India Innovation Growth Program 2013
5. Chattopadhyay, Santanu (2012) Supreme Engineering Faculty Award

**Sponsored Research Projects**

1. 3-D Image Sensor for Capturing Minute Surface Details and Visualization by Geometric Modelling (DST, Govt. of India, Rs.30.00 Lakhs)
2. Advanced Adaptive Filtering for Sensor Networks and Sparse System Applications (Indo-Spanish Collaborative Project, Sponsor : DST and MICIIN, Govt. of Spain, Rs.21.00 Lakhs)
3. An embedded low cost portable CW Doppler Ultrasonography System (DST, New Delhi, Rs.24.79 Lakhs)
4. Analysis and Design of wide band compact rectangular patch antenna embedded on cylindrical pin structure (ISRO, Bangalore, Rs.18.75 Lakhs)
5. Analysis of different conducting & dielectric structures as EMI sensors (ISRO, Rs.22.31 Lakhs)
6. Automatic Speaker Recognition over VoIP (Vodafone Essar IIT Kharagpur Centre for Excellence in Telecommunication, Rs.18.00 Lakhs)
7. AVLSI Consortium (Multiple Industrial Organisation, Rs.0.00 Lakhs)
8. Bridge Health Monitoring with Wireless Sensor Network (Indian Railways, Rs.193.00 Lakhs)
9. Content base Image Retrieval for Medical Images (DIT, Rs.29.00 Lakhs)
10. Creation of Multimedia based Courseware for E&IT students to be implemented by IIT Kharagpur (DIT, Rs.115.00 Lakhs)
11. Degradation and Breakdown of Metal gate/High-k/III-V Semiconductor Structures (DST New Delhi, Rs.32.36 Lakhs)
12. Degradation and breakdown of metal gate/high-K/III-V semiconductor structures (DST, New Delhi, Rs.3.23 Lakhs)
13. Design & development of non-invasive blood glucose measuring system (Department of Information Technology, Rs.27.00 Lakhs)
14. Design & Fabrication of high sensitivity micro machined Silicon tunneling accelerometer with micro-g resolution (ISRO, IIT Kharagpur Cell 721302, Rs.37.00 Lakhs)
15. Design and Development of high speed miniaturized RF MEMS switched capacitor (ISRO, Rs.19.70 Lakhs)
16. Design and Development of non-invasive blood glucose measuring system (DIT, New Delhi, Rs.27.00 Lakhs)
17. Design and development of specialised antenna for remote communication with submerged devices (ARDE, Pune, Rs.9.76 Lakhs)
18. Design and full-wave Greens Function analysis of a coax-fed two layer dielectric resonator antenna (CSIR, New Delhi, Rs.13.08 Lakhs)
19. Design and full-wave Greens Function analysis of the ultrawideband multi-layer dielectric resonator antenna (Department of Science and Technology, Rs.54.80 Lakhs)
20. Design Automation of Analog VLSI (MCIT, DIT, Govt. of India, New Delhi, Rs.45.08 Lakhs)
21. Design of Planar Compact High Performance RF/Microwave Filters for Satellite Applications (ISRO- IIT Kharagpur Cell, Rs.8.94 Lakhs)
22. Design of radiation hardened data converters (ISRO, STC, I.I.T Kharagpur Cell., Rs.31.00 Lakhs)
23. Design, Simulation and Development of Mm-wave six port receiver--completed (ISRO, Rs.9.90 Lakhs)
24. Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning (MHRD, Rs.0.00 Lakhs)
25. Development and Realization of Silicon Tunneling Accelerometer (ISRO Inertial Systems Unit (ISU), Rs.35.00 Lakhs)
26. Development of a Lung Sound Analyzer (Institute of Pulmocare & Research, Rs.7.00 Lakhs)
27. Development of Interference Mitigation methods through Base Station Cooperation in Next Generation Wireless Broadband Mobile Communication Networks (MCIT, DIT, new Delhi, Rs.90.60 Lakhs)
28. Development of MBE cluster tool based epitaxial nano-semiconductor infrastructure and process integration facility for high performance RF/microwave c (Department of Information Technology, GOI and ATDC, IIT Kharagpur, Rs.4979.92 Lakhs)
29. Development of MEMS based Accelerometers for Aerospace Application (NPMASS) (NPMASS, ADA, Bangalore, Rs.449.00 Lakhs)
30. Development of readout system for Muon system in CBM experiment at FAIR (NSC) (VECC, Kolkata/Govt. of India, Rs.50.00 Lakhs)
31. Development of MEMS based components for RF applications (NPMASS, Rs.166.00 Lakhs)
32. Digital Electronic Circuits Virtual Laboratory (MHRD, Rs.50.00 Lakhs)
33. Dual-band reconfigurable antenna tunable over a wide range (DEAL, Dehradun, Rs.9.71 Lakhs)
34. Energy Efficient Communication (ISRO, Rs.1.00 Lakhs)
35. Energy Efficient Radio for next generation cellular (VEICET, Rs.185.00 Lakhs)
36. Energy Efficient Routing (ISRO, Rs.0.00 Lakhs)
37. Enhancement of Transport Layer Performance for Inter Planetary Network (Indian Space Research Organization and KCSTC, Rs.11.00 Lakhs)
38. Enhancement of Transport Layer Performance for Inter Planetary Network (ETP) (SAC, ISRO, Rs.5.00 Lakhs)
39. Error Resilient Schemes for Satellite TV Systems (ISRO, Rs.12.00 Lakhs)
40. Fault diagnosis techniques for yield enhancement (Synopsys, USA, Rs.25.00 Lakhs)
42. FPGA based design and development of H.264 Codec (ISRO, Rs.14.80 Lakhs)
43. GaN/InGaN based light emitting diodes, solar cells and photoelectrochemical (PEC) devices by MOCVD epitaxial process (Department of Science & Technology, Govt. of India, Rs.657.00 Lakhs)
44. Green Cellular Network (VEICET, Rs.20.00 Lakhs)
45. Handset Normalization and Reduction of Noise and Distortion for Voice Authentication (ISRO, India, Rs.11.00 Lakhs)
46. Iron disilicide heterojunction solar cells (Dept. of Science & Technology, Govt. of India, Rs.15.36 Lakhs)
47. Iron Disilicide Heterojunction Solar Cells (DST, Rs.15.00 Lakhs)
48. Ka Band Propagation Experiments over Indian tropical Region for Improvement of Ka Band Satellite Communication (ISRO, IIT Kharagpur Cell, Rs.26.73 Lakhs)
49. MEMS based micropropulsion devices for micro satellite program (ISRO, Rs.123.00 Lakhs)
50. Microelectronics and VLSI Engineering Online Laboratory (MHRD, Rs.100.00 Lakhs)
51. Modelling, simulation and fabrication of Split Ring Resonators (VRDE, Ahmadnagar, Rs.9.83 Lakhs)
52. Multiple Access Array Antenna system at S band using Digital Beam Forming Techniques (DBT) (SAC, ISRO, Rs.5.00 Lakhs)
53. Multiple Access array antenna system at s-band using digital beamforming techniques—completed (ISRO, Rs.24.50 Lakhs)
54. NMEICT Talk to 10,000 Teachers (MHRD, Rs.6600.00 Lakhs)
55. Non-invasive blood glucose measurement system: Prototype development, Evaluation & Testing (ICMR, New Delhi, Rs.21.78 Lakhs)
56. Optimal Solutions and Applications for the Next Generation Wireless Internet (VEICET-Vodafone-Essar, Rs.46.00 Lakhs)
57. Planar inverted F-antenna for mobile communication (Ministry of Science and Technology, Rs.8.00 Lakhs)
58. Railway Bridge Health Monitoring System with Wireless Sensor Networks (Indian Railways, Govt. of India, Rs.187.02 Lakhs)
Consultancy Projects

1. Design of methodology for robust analogue building blocks (Sankalp Semiconductor Pvt. Ltd., Rs.1.65 Lakhs)
2. Design of monopulse Ka-band antenna and waveguide system (VEM Technologies Ltd., Hyderabad, Rs.10.25 Lakhs)
3. Design of Software-only High Definition Video Codec based on H.264 (Intellisys Technologies and Research Limited, Kolkata, Rs.13.23 Lakhs)
4. Design of switch capacitor based embedded DC-DC buck converter (Maxim India Integrated Circuit Pvt. Ltd., Rs.10.32 Lakhs)
5. Developing Pedagogical Methods (Subject: Network Theory) (MHRD, Govt. of India, Rs.2.00 Lakhs)
6. Efficient and Reliable Transport Protocol for Mobile Ad Hoc Networks (Defence Electronics Applications Lab (DEAL), DRDO, Dehradun, Rs.9.75 Lakhs)
7. Real Time Image Processing for Conveyor Belt Health Monitoring (PHOENIX Conveyor Systems, Rs.22.00 Lakhs)
8. Studies on GPR wave Propagation through Soil (LRDE, DRDO, Rs.1.72 Lakhs)

Patents (filed / granted)

1. A CALLER AUTHENTICATION SYSTEM FOR COMPUTER BASED VOIP CALLS
2. A LOW-COST BIOMETRIC AUTHENTICATION SYSTEM FOR ONLINE CERTIFICATION COURSE
3. An Energy and QoS Aware Method for Vertical Handover among Heterogeneous Wireless Networks
4. An Improved Molecular Beam Epitaxy Multi Chamber Cluster Tool And Processes For Integration Of Multiple Growth Combination Of Group III-V Semiconductor Heterostructures
5. An integrated automated system for assessing and monitoring the cardiac status and pulse rate
6. Fiber optic corrosion sensor
7. Heart Sound Analyzer
8. Lung Sound Analyzer
9. Method of video coding the movement of a human face from a sequence of images

Visits Abroad by Faculty Members

1. Chakraborty, Mrityunjoy - INDO-Spanish Joint Project (Universidad Carlos Ill de Madrid, ) October 23-Nov. 4, 2012
5. Dutta, Debasish - Research Collaboration (Monash University, Malaysia Campus, ) March 27-29, 2013
6. - Presenting my paper in INEC 2013 conference (Singapore, ) 2nd-4th January, 2013
7. Chakraborty, Mrityunjoy - To attend IEEE ISCAS 2012 (Seoul, South Korea, ) May 20-23, 2012
8. Chakraborty, Mrityunjoy - INSA-JSPS fellowship (Kyoto University, Kyoto, Japan, ) May 24-June 13, 2012
9. Maiti, Chinmay Kumar - To attend REV2012 (Sydney Australia, ) Feb 6-8, 2013
10. Datta, Raja - To present a research paper in International Conference on Distributed Computing and Networking (Hong Kong, ) January 2 to January 7, 2012
11. Layek, Ritwik Kumar - To present a paper in 51th IEEE Conference on Decision and Control(CDC) (Maui, Hawaii, USA, ) 8-16 Dec, 2012
12. Mukhopadhyay, Sudipta - To attend SPIE Medical Imaging 2013 (Orlando, Florida, ) 9th to 14th Feb, 2013
13. Biswas, Dhrubes - Invitation towards collaboration between National Chiao Tung University (National Chiao Tung University, Taiwan, ) 17-12-2012 to 21-12-2012
14. Biswas, Dhrubes - Invited Talk (University of Jyvaskyla, Agora Center, University of Jyvaskyla, Finland, ) 08-10-2012 to 12-10-2012
15. Battacharyya, Tarun Kanti - Collaborative research under ITPAR program (FBK Trento, Italy, ) 15th May 2012 - 15th June 2012
16. Biswas, Prabir Kumar - ACM ICPC World Final (Warsaw, Poland, )
18. Bhattacharyya, Tarun Kanti - To present the anual progress report and to participate in 19th CBM meeting under FAIR project (GSI Darmstadt, Germany, ) 5 Days
19. Roy, Rajarshi - To attend, present papers in 4th Nordic Workshop on system and network optimization in wireless (Akashotelit, Ylias, Lapland, Finland, ) 2nd-6th April, 2013
20. Biswas, Prabir Kumar - IEEE Picture Coding Symposium (Krakow, Poland, )
21. Datta, Raja - To present a research paper and to be Session Chair of IEEE WCNC (Shanghai, China, ) total 4 hours in 7-10 April 2013

Invited Lectures by Faculty Members

1. Decoding cellular dynamics by Layek, Ritwik Kumar (IIT Kharagpur (Medical Imaging Workshop))
2. Embedded system design for Bio-medical system instrumentation by Banerjee, Swapna (Birla Institute of Technology, Mesra, Jharkhand.)
3. QoS Aware Fuzzy Rule Based Vertical Handoff Decision Algorithm for Heterogeneous Wireless Networks by Mahapatra, Sudipta (IGIT Sarang)
4. Advance in RF and Microwave Technologies. by Sarkar, Binay Kumar (Indian Institute of Space Science and Technology, Trivandrum)
5. Radar- An efficient sensor. by Sarkar, Binay Kumar (Indian School of Mines, Dhanbad)
6. Automatic Speaker Recognition on VoIP by Saha, Goutam (Special Interest Group (SIG) Meeting at Delhi on VAS and its policies)
7. Hollow-core photonic crystal fibers by Varshney, Shailendra Kumar (CGCRI Kolkata)
8. Photonic Crystal fibers and its applications by Varshney, Shailendra Kumar (Material Science Center, IITKGP)
10. MEMS based inertial sensors and interfacing electronics by Bhattacharyya, Tarun Kanti (IIT Delhi)
11. Design and implementation of micro-machined cantilever structures for MEMS- based digital inverter a by Bhattacharyya, Tarun Kanti (CMET Pune)
12. MEMS based micropropulsion systems for space application by Bhattacharyya, Tarun Kanti (IISC Bangalore)
13. Nanotechnology by Bhattacharyya, Tarun Kanti (IETE Zonal Seminar Ranchi)
14. Sparse Adaptive Filters : an Overview and Some New Results by Chakraborty, Mrityunjoy (Kyoto University, Kyoto, Japan)
15. Recent Advances in Sparse System Identification by Chakraborty, Mrityunjoy (Niigata University, Japan)
16. Adaptive Sparse System Identification : Recent Trends and Some New Results by Chakraborty, Mrityunjoy (Kansai University)
17. A SPT Treatment to the Realization of the Sign-LMS based Adaptive Filters by Chakraborty, Mrityunjoy (Tokyo Metropolitan University, Tokyo)
18. Sparse Adaptive Filters : Recent Trends and Some New Results by Chakraborty, Mrityunjoy (Universidad Carlos III de Madrid)
19. Adaptive Identification of Sparse Systems : Recent Trends and Some New Results by Chakraborty, Mrityunjoy (Universidad Carlos III de Madrid)
20. Image Enhancement using Stochastic Resonance by Biswas, Prabir Kumar (Siddaganga Institute of Technology, Tumkur)
21. Recent Trends in Computer Networking by Datta, Raja (North Eastern Regional Institute of Science and Technology, Arunachal Pradesh)
22. Communication Technologies by Datta, Raja (Calcutta Electric Supply Corporation (CESC),Kolkata)
23. Evolving Computer Networks with special emphasis to Wireless Sensor Networks by Datta, Raja (Defence Research and Development Lab, DRDO, Hyderabad)
24. Recent trends in Networking by Datta, Raja (National Institute of Technology (NIT) Agartala)

Books Published


Short-Term Courses, Training Programmes and Workshops organised

1. Advanced DSP Design Techniques (July 2-6, 2012)
4. ISRO Scientists Refresher program on Basic Theoretical topics of RF and Microwaves (14 days)
5. Microwave Fundamental & its applications to Radar and Avionics (Two weeks ( 21-05-12 to 02-06-12 ))
6. QIP Short Term Course On Microwave Fundamentals & its applications in Radar and Avionics (May 21 – June 2, 2012)
8. Telecommunication Networks & Security for BSF Officers (September 26 to October 1, 2011)
9. Telecommunication Networks with State of the art Hands on Experiments (June 20 to June 27, 2011)
5. A Framework for Multiple Fault Diagnosis based on Multiple Fault Simulation using Particle Swarm Optimizatio By S. Kundu, A. Jha, S. Chattopadhyay, I. Sengupta, R. Kapur IEEE Transactions on VLSI Accepted (0)
13. A system for behavior prediction based on neural signals By Mathew, Jacob Sahoo, Laxmikanta Saha, Goutam Neurocomputing 97, 214-222 (2012)
15. An Energy and QoS Aware FUZZY-TOP Vertical Handover Decision Mechanism for Heterogeneous Wireless Networks By Vasu K, Sumit Maheshwari, Sudipta Mahapatra, C.S. Kumar IET networks (Accepted) (0)
20. AODV based Technique for Quick and Secure Local Recovery from Link Failures in MANETs By Sajal Sarkar and Raja Datta International Journal of Communication Networks and Distributed Systems Accepted (2012)
21. Application Mapping onto Mesh based Network-on-Chip using Discrete Particle Swarm Optimization By P. K. Sahu, T. Shah, K. Manna, S. Chattopadhyay IEEE Transactions on VLSI Accepted (0)


34. Dispersion Characteristics of All-Glass Photonic Crystal Fiber By Sanjaykumar Gowre, Sudipta Mahapatra, S. K. Varshney, P. K. Sahu Optik (Accepted) (0)


37. Effects of substrate strain and electrical stress on lattice dynamics, defects, and traps in strained-Si/Si0.81Ge0.19 n-type metal-oxide-semiconductor field effect transistors By C. Mukherjee, S. Sengupta, C. K. Maiti, and T. K. Maiti J. Appl. Phys. vol. 111, pp. 104507 (2012)


52. High Throughput Turbo Decoder Using Pipelined Parallel Architecture and Collision Free Interleaver By S.M. Karim and I. Chakrabarti IET Communications vol. 6, no. 11 (2012)


87. VLSI architecture for parallel radix-4 CORDIC By B. Lakshmi and A. S. Dhar Microprocessors and Microsystems vol. 37, pp. 79-86 (2013)
1. 3D texture analysis of solitary pulmonary nodules using co-concurrence matrix from volumetric lung CT images, By Ashis Kumar Dhara, Sudipta Mukhopadhyay and Niranjan Khandelwal, SPIE Medical Imaging 2013, Orlando, Florida, USA, (2013)
4. A miniature, high sensitivity, surface micro-machined displacement sensor with high resolution, By Tania Mukherjee and Tarun K Bhattacharyya, IEEE/ASME International Conference on Advanced intelligent Mechatronics (AIM), (2012)
5. A power efficient and constant -gm 1.8 Volt CMOS operational transconductance amplifier with rail to rail input and out put range for charge pump phase lock loop, By Manas Kumar Hati and Tarun K Bhattacharyya, IEEE International conference on devices , circuits and systems (ICDCS), (2012)
19. Design and implementation of micro-machined cantilever structures for MEMS- based digital inverter and electron tunneling sensor ( Plenary talk), By T K Bhattacharyya, International symposium on Physics and Technology of sensors (ISPTS), Pune, (2012)
20. Design of 1 Volt Band Gap reference without native MOS transistor in 0.18 um CMOS technology, By P Arivazhagan and T K Bhattacharyya, Third International Conference on Computing Communication and Networking Technology (ICCCNT), (2012)


41. Generalized Mechanism of SOTDMA and Probability of Reception for Satellite-based AIS, By Anindya Harchoudhury, Kalyan Bandyopadhyay, Binoy Kumar Sarkar and A.


63. Phonon and Lattice Dynamics in Tri-gate FinFETs on (100) and (110) Si Substrates, By C. Mukherjee, and C. K. Maiti, *IEEE 28th International Conference on Microelectronics (MIEL)*, Serbia, (2012)


73. Spectral compatibility of BOC(5,2) modulation with existing GNSS signal, By S. B. Sekar, S. Sengupta, K. Bandyopadhyay, *Position Navigation and Location Symposium (PLANS)*,, Myrtle Beach, South Carolina, (2012)

74. Spur Suppression in Frequency Synthesizer using Switched Capacitor Array, By Debasis Mandal, Pradip Mandal, and Tarun Kanti Bhattacharyya, *International SoC Design Conference (ISOCC)*, Jeju Island, Korea (South), (2012)


Department of Geology & Geophysics

Head
Prof. Debashish Sengupta  from  01.01.2013

Professors
Bhattacharya, Abhijit  Ph.D.(IIT Kharagpur),
Bhattacharya, Amit Kumar  Ph.D.(IIT Kharagpur),
Bhowmik, Santanu Kumar  Ph.D.(Jadavpur Univ), Metamorphic Petrology, Geochronology
Das, Subhasish  Ph.D.(IIT Kharagpur), Sedimentology, Basin Tectonics
Gupta, Anil Kumar  Ph.D.(BHU, Varanasi),
Gupta, Saibal  Ph.D.(Cantab), Structural Geology, Metamorphic Petrology, Tectonics
Mamtani, Manish A  Ph.D.(MSU, Baroda), Structural Geology, Microtectonics
Mishra, Biswajit  Ph.D.(IIT Kharagpur), Ore Geology and Metamorphic Petrology
Nath, Sankar Kumar  Ph.D.(IIT Kharagpur), Earthquake and Engineering Seismology, Seismic Hazard Vulnerability & Risk Assessment and Microzonation, Seismic Prospecting, Geophysical Signal Processing, Geophysical Tomography, Computational Geophysics, Sequence Stratigraphy
Panigrahi, Mruganka Kumar  Ph.D.(IIT Kharagpur), Economic Geology, Crustal Fluids, Computer Applications
Sarkar, Anindya  Ph.D (Gujrat Univ.), Stable Isotope Geochemistry, Sedimentology, Palaeoclimatology
Sen Gupta, Debashish  Ph.D.(PRL, Ahmedabad), Modeling of Environmental Radioactivity and Nuclear Geophysics and its applications
Sharma, Shashi Prakash  Ph.D.(BHU, Varanasi), Electrical and EM Geophysics, Integrated Geophysical Research, Modeling and Inversion, Groundwater Geophysics
Tripathy, Subhasish  Ph.D.(IIT Bombay), Environmental Geochemistry, Waste Utilization

Associate Professor
Mohanty, William Kumar  Ph.D.(Delhi Univ.), Seismology, Seismic Hazard Assessment, Gravity & Magnetic Methods of Prospecting, Reservoir Characterization

Assistant Professors
Basu, Arindam  Ph.D.(The Univ. of Hong Kong), Rock Mechanics, Engineering Geology
Mukherjee, Abhijit  Ph.D.(Univ. of Kentucky, USA), Surface water-sea water-groundwater interaction, Mine-site hydrology, Physical Chemical and Isotope Hydrogeology, Contaminant Fate and Transport, Environmental Geochemistry, Effect of Climate Change
Pruseth, Kamal Lochan  Ph.D.(IIT Kharagpur), Sulfide Phase Equilibria, Experimental Petrology, Ore Geology
Ray, Sanghamitra  Ph.D.(Calcutta Univ), Vertebrate paleobiology, Gondwana stratigraphy and sedimentation
Sengupta, Probal  Ph.D.(IIT Kharagpur), Seismology, Geoexploration, Seismic prospecting
Singh, Arun  Ph.D.(NGRI), Seismic anisotropy: Mantle deformation Patterns, Lithospheric Structure and geodynamics, Teleseismic tomography
Singh, Chandrani  Ph.D.(NGRI), Reservoir Triggered Seismicity, Attenuation characteristics of seismic waves, Seismotectonics

Upadhyay, Dewashish  Ph.D.(Univ. of Bonn, Germany), Geochemistry, Igneous Petrology, Cosmochemistry

Brief Description of on-going activities

Tectonic evolution of craton – mobile belt ensembles in parts of the Indian shield; Gold mineralization in greenstone belts of Dharwar Craton; Metamorphic remobilization of massive sulphide deposits; Studies on Indian microvertebrates, Lithospheric structure across Himalaya, Deformation at Collisional boundaries, Stable isotopes in Himalayan foreland sediments; Paleogene climate of Kutch, Rajasthan, Environment in ancient sedimentary basins in India; Seismic Hazard assessment and microzonation in the NE India and metropolitan cities, Improvement of rock index test methods and mechanical characterization of rock materials, Groundwater potential assessment and pollution by natural and anthropogenic causes; Waste utilizations, wasteland development and acid marine drainage; Natural radiation hazard estimation.Studies on Indian monsoon (both modern and ancient) and paleoclimate studies of the Indian subcontinent and paleoceanography of the Indian Ocean.

Thrust Areas

1. Seismology
2. Paleoclimatology (Paleontology, Geochemistry)
3. Crustal Evolution and Metallogeny
4. Environmental Hazards and Mitigation

New Acquisitions

1. Very Low Frequency-Resistivity equipment- manufactured by Geonics Canada

Lectures by Visiting Experts

2. India-Asia collision and evolution of Neotethys (1st March 2013, Prof. Tara Charan Bagchi Lecture Series) by Prof. Jonathan Aitchison (Head, School of Geosciences, University of Sydney)
4. Uranium resources of India towards meeting the energy needs (22nd March 2013, Prithvi-2013) by Dr. A. K. Sarangi (GM (Corporate Planning), Uranium Corporation of India Limited)
5. Exploration, Mining & beneficiation of bauxite (22nd March, 2013, Prithvi-2013) by Dr. M. Kumar (CEO, Vedanta)
6. Delineation of basement depth and thrust-fault location using gravity-magnetic data in Mizoram area (23rd March, 2013, Prithvi-2013) by Dr. G. K. Ghosh (Oil India Limited)
7. Estimation of earth velocity model- bridging the gap between geology and geophysics (8th March 2013) by Dr. D. P. Sinha (EnerGeo India Ltd.)
8. Crustal structure of the Shillong plateau and the Bay of Bengal, gleaned from broadband seismic tomography (23rd March 2013, Prithvi-2013) by Prof. V. K. Gaur (Indian Institute of Astrophysics)

Doctoral and MS Degrees Awarded

2. Debarati Mukherjee : Taphonomy, phylogeny and paleobiology of a new Hyperodapedon (Archosauromorpha; Rhynchosauria) from the Upper Triassic of central India (Provisional Certificate used in September 2012))(Ph.D.)
Member - Professional Bodies

1. Sarkar, Anindya, Member - Indo-US organizing committee on frontiers of science, 2009
2. Sarkar, Anindya, Member - Research Advisory Council, Birbal sahni Institute, Lucknow, 2008-09
3. Sarkar, Anindya, Member - Search and selection committee, Presidency University, 2011-12
4. Sarkar, Anindya, - Member, PAMC, Ocean Science and Resources, MOES, 2012
5. Sarkar, Anindya, Member - International Geological Correlation Program (IGCP) Project
7. Sarkar, Anindya, Member - Indian Society of Mass Spectrometry
8. Ray, Sanghamitra, Member - The Palaeontological Association, UK
9. Ray, Sanghamitra, Member - Society of Vertebrate Paleontology, USA
10. Basu, Arindam, Life Member - Indian Society of Engineering Geology (Indian National Group of International Association for Engineering Geology and Environment)
11. Basu, Arindam, Member - International Society for Rock Mechanics (through the National Group of India)
12. Upadhyay, Dewashish, Member - European Association of Geochemistry
13. Pruseth, Kamal Lochan, Member - European Association of Geochemistry
14. Mukherjee, Abhijit, - Geological Society of America
15. Mukherjee, Abhijit, - International Association of Hydrogeologists
16. Mukherjee, Abhijit, Member - Indian Science Congress Association
17. Mishra, Biswajit, Life Fellow - Geological Society of India
18. Mishra, Biswajit, Fellow - Society of Economic Geologists (SEG), USA
19. Mishra, Biswajit, National representative - IMA-COM (International Mineralogical Association-Commission on Ore Mineralogy)
20. Mishra, Biswajit, Member - INSA National Committee of IUGS-SCL-INQUA
21. Nath, Sankar Kumar, Regular Member - Member Registration No. 8810 : The Mining Geological & Metallurgical Institute of India (MGMI)
22. Nath, Sankar Kumar, Life Member - Life Member (No. 10283967): American Geophysics Union (AGU).
23. Nath, Sankar Kumar, Senior Member - Member (No. 16472): The Seismological Society of America (SSA).
24. Nath, Sankar Kumar, Senior Life Member - Life Member (L/141): The Indian Society of Theoretical and Applied Mechanics
25. Nath, Sankar Kumar, Senior Life Fellow - Life Fellow (No.236): The Geological, Mining and Metallurgical Society of India (GMMSI)
27. Das, Subhasish, Member - Research Board of Advisors, American Biographical Institute, USA
28. Das, Subhasish, Life Member - Indian Association of Sedimentologists,Aligarh
29. Das, Subhasish, Member - Wadia Institute of Himalayan Geology, Dehradun
30. Panigrahi, Mruganka Kumar, Member - Association of Applied Geochemists
31. Panigrahi, Mruganka Kumar, Member - Society for Geology Applied to Mineral Deposits
32. Panigrahi, Mruganka Kumar, Member - Society of Resource Geology
33. Sharma, Shashi Prakash, Regular - Association of Exploration Geophysicist, Hyderabad, India
34. Sharma, Shashi Prakash, Regular - National Academy of Sciences, Allahabad, U.P.

Member - Editorial Board

4. Gupta, Saibal (0) Member, Editorial Board - Indian Journal of Geology
5. Gupta, Saibal (0) Member, Editorial Board - Himalayan Geology
Awards & Honours

1. Nath, Sankar Kumar (2009) "A.S. Arya – IIT Roorkee Disaster Prevention Award" for outstanding contributions in the field of Disaster Prevention/Mitigation
4. Sarkar, Anindya (2010) Benjamin Meaker Professor, Inst. of Advanced Studies and Dept. of Chemistry, Bristol University
5. Nath, Sankar Kumar (2003) Bharat Jyoti Award by India International Friendship Society
7. Singh, Chandrani (2008) Certificate of Commendation from NGRI for having five SCI publications in one year
8. Nath, Sankar Kumar (2006) D. N. Thakur Award (Gold Medal) for 2005-2006 in Earth Sciences by the Mining, Geological and Metallurgical Institute of India
9. Singh, Chandrani (2006) Department of Science and Technology (DST) Young Scientist Best Presentation Award
10. Mukherjee, Abhijit (2005) Dissertation Enhancement Award, University of Kentucky
13. Mamtani, Manish A (2006) Europe Research Fellowship by the Alexander von Humboldt Foundation (Germany)
14. Mukherjee, Abhijit (2005) Ferm Grant, Department of Geological Sciences, University of Kentucky
16. Mamtani, Manish A (2007) H. H. Read Memorial Gold Medal Award by the Society of Geoscientists and Allied Technologists, Bhubaneswar
20. Singh, Chandrani (2010) Indian Science Congress Young Scientist Award in Earth Science category
21. Mishra, Biswajit (1986) INSA Young Scientist award
25. Mamtani, Manish A (2002) K. Naha Award for Structural Geology by the Geological Society of India
28. Mamtani, Manish A (2010) National Geoscience Award (in Basic Geosciences) by the Ministry of Mines (Government of India)
33. Mukherjee, Abhijit (1999) National Scholarship, Govt. of India
34. Basu, Arindam (2006) Postdoctoral Fellowship by FAPESP @ University of Sao Paulo, Brazil
35. Basu, Arindam () Postgraduate Studentship by CRGC during MPhil and PhD studies @ University of Hong Kong, HKSAR
36. Mishra, Biswajit (2000) PRL Award in Earth Sciences
37. Gupta, Anil Kumar (2004) Prof. T.M. Harris Medal by the Birbal Sahni Institute of Palaeobotany, Lucknow
38. Singh, Chandrani (2010) Selected as only member from India in the International Advisory Board Members for BITs 1St Annual World Congress of Hydraulic Fracturing & Acidizing, Xian, China
40. Nath, Sankar Kumar (2002) Shanti Swarup Bhatnagar Prize
42. Sarkar, Anindya (2010) Visiting Professor, Purdue University
44. Sarkar, Anindya (2004) Visiting Scientist, University College London

**Sponsored Research Projects**

1. Anatomy of the Himalayan orogeny using direct S waves (ISIRD, Rs.4.50 Lakhs)
2. Characterization of Seismicity in the Kumaun Himalaya for Hazard Assessment (MOES(Ministry of Earth Sciences Govt. of India), Rs.7.00 Lakhs)
3. Characterization of Seismicity in the Kumaun Himalaya for Hazard Assessment (MOES(Ministry of Earth Sciences Govt. of India), Rs.0.00 Lakhs)
4. Crust formation and terrane amalgamation in eastern India—constraints from enclaves in the Chhotanagpur Gneissic Complex (Indian Institute of Technology, Kharagpur, Rs.5.00 Lakhs)
5. Crustal seismic attenuation characteristics in Nepal Himalaya and southern Tibet from Lg Q inversion (ISIRD, Rs.4.00 Lakhs)
6. Deciphering the history of hydrothermal activity and controls on uranium mineralization at Koppunurur: constraints from mineral chemistry, stable isoto (BRNS, Rs.29.83 Lakhs)
7. Establishment of Electron Probe Micro Analyzer (EPMA) National Facility IIT, Kharagpur (DST, Rs.573.18 Lakhs)
8. Evaluating the potential of Malani Igneous Suite rocks, Rajasthan for Uranium mineralization using petrological and geochemical proxies (BRNS, Rs.35.00 Lakhs)
9. First Order Seismic Microzonation of Kolkata Area Based on Deep & Shallow Geotechnical and Geophysical Investigations (Ongoing) (Ministry of Earth Sciences, Govt. of India, Rs.62.10 Lakhs)
10. Geophysical Syurvey using Gravity and Magnetic methods in South Purulia Shear Zone (BRNS, Department of Atomic Energy, Rs.19.63 Lakhs)
11. Groundwater-Sea water interaction at a coastal aquifer adjoining the Bay of Bengal: implications on flux and solute exchange (ISIRD, SRIC IIT Kharagpur, Rs.5.00 Lakhs)
12. Indian Geoid low: A feasibility study (MOES(Ministry of Earth Sciences Govt. of India), Rs.22.80 Lakhs)
14. Influence of S-fugacity on the minimum temperature of melting in the system Pb-Fe-Zn-S: implication on sulfide ore remobilization by partial melting (SRIC-ISIRD, Rs.5.00 Lakhs)
15. Investigation of the basement structure of the Bengal Basin using Gravity and Seismic data (ISIRD IIT Kharagpur, Rs.3.00 Lakhs)
16. Isotopes of water in India (2008-2013; on-going) (DST, Rs.12.00 Lakhs)
17. Microzonation and Evaluation of Vulnerability and Socio-Economic Impacts for the City of Kolkata including Greater Kolkata (MOES, Rs.432.71 Lakhs)  
18. National stable Isotope facility project at IIT, Kharagpur, sponsored by DST (outlay ~Rs. 200 lacs, 2004-2010; on-going). (DST, Rs.230.00 Lakhs)  
19. Predicting crack initiation stress by porosity and evaluating microstructural control on crack initiation: a study on granite (DST, New Delhi, Rs.18.56 Lakhs)  
20. Quantitative assessment of weathering grades of rock materials (ISIRD, IIT Kharagpur (Completed), Rs.0.00 Lakhs)  
21. Reservoir Characterization using Artificial Intelligent Techniques (Soft Computing) (Oil & Natural Gas Corporation Ltd. (ONGC), Dehradun, Rs.45.72 Lakhs)  
22. Seismic Hazard and Risk Assessment of Darjeeling-Sikkim Himalaya (Ongoing) (Ministry of Earth Sciences, Govt. of India, Rs.40.00 Lakhs)  
23. Seismic Hazard Assessment, Microzonation, and Evaluation of Vulnerability & Risk of the Urban Kolkata (Ongoing) (Ministry of Earth Sciences, Govt. of India, Rs.432.71 Lakhs)  
24. Seismic Vulnerability Assessment of Building types in India. (Fund Received, Execution initiated) (NDMA, Ministry of Home Affairs, Govt. of India, Rs.25.20 Lakhs)  
25. Seismicity monitoring, Maintenance of the Existing 16 Station Sikkim Strong Motion Array and Probabilistic Seismic Hazard Assessment of Darjeeling-Si (MOES, Rs.62.50 Lakhs)  
26. Strong Motion Seismometry, Probabilistic Seismic Hazard, Vulnerability and Risk Microzonation of Darjeeling-Sikkim Himalaya (New Project to commence) (MoES, Rs.75.00 Lakhs)  
27. Structural, mineralogical and geochemical appraisals of the Pur-Banera basin, Rajasthan for assessing its uranium potential (BRNS, Rs.34.10 Lakhs)  
28. Testing models for mountain building in the northeastern Himalaya (Royal Society, Rs.0.00 Lakhs)  
29. The exhumation factor in the genesis of inverted metamorphic sequences – an evaluation from structure, metamorphism, fluid inclusions and earthquake (DST, Rs.14.22 Lakhs)  
30. The Indian Continental Shelf as a potential source of Phosphate (Ministry of Earth Sciences, Rs.93.00 Lakhs)  
31. The relationship between anisotropy of magnetic susceptibility, strength anisotropy and microstructure in rocks devoid of mesoscopic foliations (DST, New Delhi, Rs.21.02 Lakhs)  
32. The relationship between anisotropy of magnetic susceptibility, strength anisotropy and microstructure in rocks devoid of mesoscopic foliations (DST, New Delhi (Completed), Rs.21.02 Lakhs)  
33. The Thermal Evolution of Peninsula India: Past behaviors and Future Potential. (Australia – India Strategic Research Fund (AISRF) and Department of Science and Technology (DST), Rs.13.59 Lakhs)  
34. Thermal History of the Inverted Metamorphic Sequence from the Northwestern Arunachal Pradesh: Constraints from Microstructure, Thermobarometry and P-T (CSIR, Rs.18.72 Lakhs)  
35. Vertebrate microfossils from the Tiki Formation of the Rewa Gondwana basin: an integrated study on Upper Triassic biodiversity (SERB, DST India, Rs.25.00 Lakhs)

**Consultancy Projects**

1. HYDROLOGICAL STUDIES AT BANGUR CHROMITE MINES (Govt of Orissa, Rs.11.30 Lakhs)  
2. GEOPHYSICAL AND HYDROGEOLOGICAL STUDY AT PROPOSED PROJECT SITE AT DURMUT, BLOCK : RAGHUNATHPUR-I, PURULIA. (Reliance Industries, Rs.18.25 Lakhs)  
3. Ground Vibration study on Inganijharan Iron and Manganese Mines in District Keonjhar, Orissa (Bhanja Minerals Pvt. Ltd., Rs.2.48 Lakhs)  
4. Integrated geological and geophysical study around Tangarapada area, Orissa (The Industrial Development Corporation of Orissa Ltd. (IDCOL) Government of Orissa, Rs.10.68 Lakhs)  
5. LA-ICPMS Analytical facility (Various users, Rs.3.00 Lakhs)  
6. LA-ICPMS Analytical Facility (Various users, Rs.3.00 Lakhs)  
7. Probabilistic Assessment of Tsunamigenic Earthquake Originating from Burmese-Andaman Arc System (BAAS) and West Sunda Arc (WSA) (Nuclear Power Corporation of India, Limited, Government of India, Rs.0.00 Lakhs)  
8. Probabilistic seismic hazard analysis for Kakarapara Atomic Power Plant (KAPS-1,2) (Nuclear Power Corporation of India Limited, Government of India, Rs.10.75 Lakhs)
9. Seismic Hazard Analysis (SHA) and preparation of seismic hazard curves (SHC) for smelter and CPP area of Aditya Aluminium at Lapanga, Sambalpur, Oriss (Aditya Aluminium, Rs.4.30 Lakhs)

10. Site Specific seismic hazard study of west Sikkim region for the Rangit II Hydro- Electric project (M/S Gammon India Limited, Mumbai, India, Rs.4.16 Lakhs)

Visits Abroad by Faculty Members

2. Upadhyay, Dewashish - Collaborative research work (University of Muenster, Germany, ) May to July 2011
3. Mishra, Biswajit - For collaborative research (School of Earth & Environmental Sciences, University of Adelaide, ) July 1 to July 14, 2011
6. Basu, Arindam - Participating in EUROCK 2012 (Stockholm, ) 28-30 May 2012 (conference duration)

Invited Lectures by Faculty Members

1. Rock deformation, fabric analysis, and applications ( during Green Earth Day -2012) by Mamanti, Manish A (OASTC, IIT Kharagpur)
2. Microcrack anisotropy quantification and its application in exploration of mineral resources by Mamanti, Manish A (Kumaun University, Nainital)
3. Anisotropy of Magnetic Susceptibility (AMS) - Principles, Methods, Scope and Limitations by Mamanti, Manish A (Sambalpur University (Orissa))
4. Application of Anisotropy of Magnetic Susceptibility (AMS) in Structural Geology and Tectonics - by Mamanti, Manish A (Sambalpur University Orissa))
5. VLF electromagnetic method- A near surface geophysical approach by Sharma, Shashi Prakash (GandhiNagar, Gujrat)
6. Geophysical Prospecting as Adjunct Faculty by Mohanty, William Kumar (IIT Bhubaneswar)
7. Thermal history of the Proterozoic granulites from northwestern, central, eastern and northeastern I by Bhowmik, Santanu Kumar (International Granulite Conference, 2013, Hyderabad)
8. Preliminary Results of the Metamorphic Studies from the Naglaland Ophiolite Complex: Implication for by Bhowmik, Santanu Kumar (International Conference on Mantle Gneiss Dome, Manali)
10. Seismic Vulnerability of the City of Kolkata by Nath, Sankar Kumar (Stadel Hotel, Salt Lake City, Kolkata (WBDMA))
11. Seismic Vulnerability of West Bengal with an emphasis on the City of Kolkata by Nath, Sankar Kumar (Administrative Training Institute, Government of West Bengal at Salt Lake City, Kolkata)

Papers Published in Journals

2. Alteration of plagioclase to nepheline in the Khariar alkaline complex, SE India: constraints on metasomatic replacement reaction mechanisms By Upadhyay D. Lithos 155, 19-29 (2012)
11. Earthquake Scenario in West Bengal with emphasis on Seismic Hazard, Vulnerability & Risk Microzonation of Kolkata City, West Bengal, India By Nath, S. K., Adhikari, M. D., Maiti, S. K., Devaraj, N., Srivastava, N and Mohapatra, L. D. Natural Hazards and Earth System Sciences Under review (2013)
13. Focusing frequency and significance of multi-frequency very low-frequency electromagnetic measurement in delineating near-surface conducting structures By S.P. Sharma and V.C. Baranwal Near Surface Geophysics 9, 435-447 (2011)
22. Lapse time and frequency-dependent attenuation characteristics of Kumaun Himalaya By Lapse time and frequency-dependent attenuation characteristics of Kumaun Himalaya Journal of Asian Earth Sciences 54-55, 64-71 (2012)


41. Seismogenesis of 18th September 2013 Sikkim Earthquake of Mw 6.9 By Adhikari M. D., Nath, S. K., Maity, S. K. Disaster Advances In press (2013)


54. VFSARES—a very fast simulated annealing FORTRAN program for interpretation of 1-D DC resistivity sounding data from various electrode arrays By S.P. Sharma *Computers and Geosciences* 42, 177-188 (2012)


**Papers Presented in Conferences**


2. Cross-section of the reaction 34Se(n,2n) 34Se through activation analysis by 14 MeV neutrons experimentally and using the compound nucleus theoretically, By Ranjita Mandal, V.N. Bhoraskar and D. Sengupta, *National Workshop on Radiation*, Ranchi, (2013)


5. Determination of kinematic vorticity number using Anisotropy of Magnetic Susceptibility (AMS) Data, By Mamtani, M.A., 2nd Rock Deformation & Structures (RDS-II) conference, Lucknow University (Lucknow), (2012)


22. VLF-EM and Radiometric studies around Beldih mine in South Purulia shear zone, India, By S. Mittal, A. Biswas, S.P. Sharma and D. Sengupta, IGU 49th Convention (Indian Geophysical Union), Gandhinagar, Gujarat, (2012)
Department of Humanities & Social Sciences

Head
Prof. Kailash Bihari Lal Srivastava

Professors

Basu, Partha  Ph.D.(Calcutta Univ), Quantitative Economics with special ref. to Efficiency and Growth

Chakraborti, Chhanda  Ph.D.(Univ of Utah), Bioethics, Business ethics, Philosophy of Mind, Logic and Philosophy of logic

Chaterjee, Suhita Chopra  Ph.D.(Bombay), Sociology of Health /Medical Sociology / Sociology of Science

Chatterjee, Bani  Ph.D.(BHU, Varanasi), Development Planning, Manpower Management, International Finance

Giri, Vijai Nath  Ph.D.(IIT Kharagpur), Conflict Resolution and Negotiation, Organizational Communication, Intercultural Communication, Interpersonal Communication

Patnaik, Priyadarshi  Ph.D.(Utkal Univ), Indian aesthetics, Visual Culture and Communication, Cultural Translation theory and practice, Media and Multimedia Studies, Emotions and nonverbal communication

Roy, Anjali  Ph.D.(Bombay), Postmodern and Post-colonial theory and literature, Culture Studies, Media Studies, Performance Studies, Diaspora Studies, Oral Histories, Partition and Punjab Studies, Folklore

Srivastava, Kailash Bihari Lal  Ph.D.(IIT Kanpur), Human Resource Management and Development, Organizational Behaviour, Knowledge management and innovation

Suar, Damodar  Ph.D.(IIT Kharagpur), Social and organizational psychology, Cognitive psychology

Tewari, Hare Ram  Ph.D.(IIT Kharagpur),

Associate Professors

Chakraborty, Jayshree  Ph.D.(IIT Kanpur), Semantics and Pragmatics, Discourse Analysis, Sociolinguistics, Indian English, Communication

Goswami, Kishor  Ph.D.(IIT Kharagpur), Development Economics (Globalization - Gender and Trade - Poverty - Food Security), Agricultural Economics, Economics of Biofuels

Komalesha, H. S.  Ph.D.(IIT Kharagpur), Translation Studies, Indian Literatures in English, Poetry, Postcolonial Literatures, Cultural Studies


Mishra, Pulak  Ph.D (Vidyasagar University), Industrial Economics, Public Economics and Policy, Economics of Rural Development

Nayak, Narayan Chandra  Ph.D.(Utkal Univ), Labour Economics Social Sector Development Agricultural Economics International Finance
**Assistant Professors**

Behera, Bhagirath  
*Ph.D. (Univ. of Bonn, Germany)*, Human Transformation and Well-Being, Environmental and Natural Resource Economics, Development Economics, New Institutional Economics, Economics of Religion, Green Economics

Das, Saswat Samay  
*Ph.D. (Utkal Univ.)*, Postmodern/postcolonial studies Critical theory Continental Philosophy

Pradhan, Rabindra Kumar  

Singh, Seema  
*Ph.D. (BHU)*, Indian Women Writing in English, Managerial Communication Styles & Employee Outcomes, Communication Skills, Feminist Narratology

**Faculty Retirement**

Hare Ram Tewari  
Professor

Pratha Basu  
Professor

**Faculty Re-employment**

Hare Ram Tewari  
Professor

Partha Basu  
Professor

**Brief Description of on-going activities**

Research and Development on:

Training and development programmes on:


**Thrust Areas**

1. Development studies
2. Human resource management and ethics
3. Cultural and communication studies

**Lectures by Visiting Experts**

1. Invited lecture by Mr. C.K. Poddar (Executive Director, NINL, Odisha)
2. Invited lecture by Mr. Srikanth Venkatachari (Senior Delivery Manager and Innovation coordinator, Cognizant Technology)
3. Invited lecture by Mr. Mark Boutros (Director, Krab Gavin Anderson)
4. Invited lecture by Ms. Barsha Chakraborty (Senior Human Resource Manager, G-Cube Solution)
5. Invited lecture by Mr. Aloke Tagore (Regional HR Head-East, Deloitte Touche Tohmastu India Pvt. Lt. Kolkata)
6. Invited lecture by Ms. Linda Johanssson (Social Sustainability Coordinator and CSR Program Developer, H & M)
7. Invited lecture by Mr. Sujit Das (Head, HR, Microland, Bangalore)
8. Invited lecture by Mr. Padmanabhan S. (Director HR, Dr. Reddy's Laboratories, Hyderabad)
9. Invited lecture by Prof. S.S. Ganesh (Asso. Professor, Xavier Institute of Management, Bhubaneswar)
10. Invited lecture by Mr. R. Shantaram (Director, Kelsa Solutions, Chennai)
11. Invited lecture by Prof. Pinaki Chakraborty (National Institute of Public Finance and Policy, New Delhi)
12. Invited lecture by Mr. Karin Holmquist (Director Sustainability Division, Atlas Copco.)
13. Invited lecture by Prof. Achin Chakraborty (IDS Kolkata)

**Doctoral and MS Degrees Awarded**

1. Mr. Amarendra Kumar Dash : Advertising Strategy and Cultural Blend: Glocal Identities in Indian TV Commercials(Ph. D.)
2. Ms. Suryatapa Kar : Antecedents, mediators, moderators, and consequences of burnout among Indian Nurses(Ph. D.)
5. Mr. Mukti Pada Bag : Evaluation of Growth and Quality Parameters of Two Species of Tilapia (Oreochromis spp.) using Artificial Feeds Prepared from Alternative Protein Sources(Ph. D.)
6. Ms. Surjya Singh Das : Impact of Behavioural Competencies on Sales Persons’ Performance, Effectiveness, Satisfaction, and Success(Ph. D.)
7. Ms. Soni Agrawal : Factors Influencing Entry and Performance of Information Technology Enabled Service Firms in India(Ph. D.)
8. Mr. Shantanu Mazumder : Emotional Intelligence and Moral Intelligence Influencing Leadership Effectiveness(Ph. D.)
9. Mr. Manish Thaplyal : Role Stress of Locomotive Pilots: Antecedents, Mediators, Consequences, and Intervention(Ph. D.)
10. Ms. Alin Borah Bortamuli : Determinants of Income, Technology Adoption, Occupational Choice, and Entrepreneurial Development in the Handloom Industry in Assam(Ph. D.)
11. Ms. Rojalini Sahoo : Antecedents and Consequences of Informal Young Care giving in Families(Ph. D.)
13. Mr. Sandip Sarkar : Interrogating Sahitya Akademi's Objective in the Global Climate of Dissemi-Nation(Ph. D.)

**Member - Professional Bodies**

1. Nayak, Narayan Chandra, *Life Member* - Indian Society of Labour Economics
2. Nayak, Narayan Chandra, *Life Member* - Regional Science Association, India
3. Nayak, Narayan Chandra, *Life Member* - Indian Economic Association
4. Nayak, Narayan Chandra, *Life Member* - The Indian Econometric Society
6. Singh, Seema, *Life Member* - All India English Teachers’ Conference (AIETC)
8. Singh, Seema, *Life Member* - Vidyasagar University English Teachers’ Consortium (VUETC), Midnapore
9. Singh, Seema, *Member* - Association for Business Communication (ABC), NY, USA
11. Singh, Seema, *Member* - University Grants Commission (UGC), New Delhi
12. Singh, Seema, *Member* - International Association for the Teachers of English as a Foreign Language (IATEFL), University of Kent, UK
13. Singh, Seema, *Life Member* - Indo-American Center for International Studies (IACIS), Hyderabad, formerly the American Studies Research Center (ASRC)
14. Singh, Seema, *Member* - English Language Teachers Association of India (ELTAI), Chennai
15. Singh, Seema, *Life Member* - National Library, Kolkata
16. Singh, Seema, *Member* - Indian Society for Technical Education (ISTE), New Delhi
17. Singh, Seema, *Member* - International Association of Business Communicators (IABC), San Francisco, California, USA
18. Singh, Seema, *Life Member* - Indian Association for English Studies (IAES)
19. Singh, Seema, *Member* - Indian Association for Commonwealth Literature and Language Studies (IACLALS), New Delhi
20. Goswami, Kishor, *Regular* - International Society on Multiple Criteria Decision Making (MCDM), USA
21. Goswami, Kishor, *Life Member* - Agricultural Economics Research Association, New Delhi, India
22. Goswami, Kishor, *Life Member* - Indian Red Cross Society, India
23. Goswami, Kishor, *Life Member* - Circle for Child and Youth Research Cooperation in India – CCYRCI, Lucknow, India
24. Komalesha, H. S., *Member* - American Literary Translators Association
27. Pradhan, Rabindra Kumar, *Life Membership* - Indian Academy of Applied Psychology
28. Chatterjee, Bani, *Life Member* - Regional Science Association
29. Chatterjee, Bani, *Life Member* - International Society of Adult Education
30. Pradhan, Rabindra Kumar, *Life Membership* - Indian Academy of Applied Psychology
31. Pradhan, Rabindra Kumar, *Annual* - International Association of Applied Psychology
32. Pradhan, Rabindra Kumar, *Life Membership* - INDIAN Society for Training and Development
33. Pradhan, Rabindra Kumar, *Life Membership* - National HRD Network
34. Pradhan, Rabindra Kumar, *Annual* - National Academy of Psychology, India
35. Pradhan, Rabindra Kumar, *Life Membership* - Indian Academy of Social Sciences
36. Pradhan, Rabindra Kumar, *Annual* - International Association of Holistic Psychology
37. Pradhan, Rabindra Kumar, *Life Membership* - Indian Science Congress Association
38. Pradhan, Rabindra Kumar, *Annual* - International Association of Cross-Cultural Psychology
39. Basu, Partha, *Life Member* - Indian Academy of Social Sciences
40. Chatterjee, Bani, *Life Member* - Regional Science Association
41. Chatterjee, Bani, *Life Member* - International Society of Adult Education
42. Pradhan, Rabindra Kumar, *Life Membership* - Indian Academy of Applied Psychology
43. Pradhan, Rabindra Kumar, *Annual* - International Association of Applied Psychology
44. Pradhan, Rabindra Kumar, *Life Membership* - INDIAN Society for Training and Development
45. Pradhan, Rabindra Kumar, *Life Membership* - National HRD Network
46. Pradhan, Rabindra Kumar, *Annual* - National Academy of Psychology, India
47. Pradhan, Rabindra Kumar, *Life Membership* - Indian Academy of Social Sciences
48. Roy, Anjali, *Senior Member* - Indian Association for Commonwealth Literature and Language
49. Roy, Anjali, *President* - Association for the Study of Australasia in Asia
50. Suar, Damodar, *Member* - Association for Psychological Sciences
51. Suar, Damodar, *Life Member* - National Academy of Psychology
52. Suar, Damodar, *Life Member* - Indian Society of Training and Development
53. Suar, Damodar, *Life Member* - The Indian Science Congress Association
54. Suar, Damodar, *Member* - Asian Association of Social Psychology
55. Srivastava, Kailash Bihari Lal, *Member* - Indian Academy of Management
57. Srivastava, Kailash Bihari Lal, *Member of the Executive Committee* - Academy of International Business, India Chapter
58. Patnaik, Priyadarshi, *Regular* - Word and Music Association
59. Chakraborti, Chhanda, *Member 2010-till date* - International Association of Bioethics
60. Chakraborti, Chhanda, *Senior member 2000-till date* - Indian Philosophical Congress
61. Chakraborti, Chhanda, *Regular member 2009-till date* - International Network of Women Philosophers, UNESCO
62. Chakraborti, Chhanda, *Nominated Program Advisor 2010-2011* - International Program Committee, 14th Congress of Logic, Methodology and Philosophy of Science (LMPS)
63. Chakraborti, Chhanda, *Member* - Forum of Medical Ethics Society
64. Chakraborti, Chhanda, *Member* - American Philosophical Association (APA)

**Member - Editorial Board**

3. Giri, Vijai Nath (0) *Editorial Board of Journal, 2006-08* - Communication Theory
4. Goswami, Kishor (2011) *Editorial Board Member* - Aisa-Pacific Economic Association Newsletter
5. Goswami, Kishor (2011) *Associate Editor* - SAGE Open (Social Science Journals)
8. Goswami, Kishor (2011) *Associate Editor* - Journal of Business Excellence
12. Pradhan, Rabindra Kumar (0) *Reviewer* - International Journal of Entrepreneurial Behaviour & Research (IJEBR)
13. Pradhan, Rabindra Kumar (0) *Reviewer* - Indore Management Journal
15. Singh, Seema (2012) *Board of Editors* - Titiksha
17. Srivastava, Kailash Bihari Lal (0) *Reviewer* - ICFAI Journal of Knowledge Management
18. Srivastava, Kailash Bihari Lal (0) *Reviewer* - Psychological Sudies
19. Srivastava, Kailash Bihari Lal (0) *Reviewer* - ICFAI Journal of Mergers and Acquisitions
20. Srivastava, Kailash Bihari Lal (0) *Member Editorial board* - Journal of Technology & Management
22. Suar, Damodar (2002) *Associate Editor* - Psychological Studies

**Awards & Honours**


**Sponsored Research Projects**

1. COMMUNITY DEVELOPMENT THROUGH CORPORATE SOCIAL RESPONSIBILITY (CSR): A BENCHMARK STUDY FOR INDUSTRIAL UNITS IN PASCHIM MEDINIPUR (ACC Limited, Rs.4.56 Lakhs)
2. Economic Value Addition of Jatropha Based Products in Northeast India (National Oilseeds and Vegetable Oils Development (NOVOD) Board, Ministry of Agriculture, Govt. of In, Rs.17.54 Lakhs)
3. Expansion of Trade and Development of Women Entrepreneurs in Handloom Industry in Assam (Indian Council of Social Science Research, Rs.5.52 Lakhs)
4. Fast fixed-point algorithms for identifying alertness and emotions—FIA (Samsung, Rs. 0.00 Lakhs)
5. Functional Explanations in Language: an Inquiry in the Context of Indian Languages (IIT, Kharagpur (ISIRD), Rs. 1.60 Lakhs)
7. Impact Assessment of Mahatma Gandhi NREGS in Orissa: A Study of Mayurbhanj and Ganjam District (Indian Council of Social Science Research, New Delhi, Rs. 5.65 Lakhs)
8. Impact of Emotional Labour on Psychological Health & Job outcomes: A Study on Indian Service Industry (Indian Council of Social Science Research, New Delhi, India, Rs. 4.32 Lakhs)
9. Performing on the Margins of India (SSHRC, Rs. 18.00 Lakhs)
10. Renovation, Extension and Modernization of Nehru Museum of Science and Technology (Ministry of Culture, Rs. 27443768.00 Lakhs)
11. SOCIAL COST BENEFIT ANALYSIS OF THE PROPOSED COAL MINE AT CHHENDIPADA TEHSIL OF ANGUL DISTRICT, ODISHA (Radhikapur (West) Coal Mining Private Ltd, Rs. 4.49 Lakhs)
12. Social impact Analysis (ACC Limited, Rs. 3.50 Lakhs)
13. Sustainability of Biodiesel Industry in North East India (South Asian Network for Development and Environmental Economics, Rs. 9.15 Lakhs)
14. Translation of Metaphysical Writings of the Pancasakha Sanths of Medieval Odisha (Indian Council of Philosophical Research, Rs. 2.00 Lakhs)

**Consultancy Projects**

1. Community Development through Corporate Social Responsibility (CSR): A Benchmark Study for Industrial Units in Paschim Medinipur (ACC Ltd, Rs. 4.56 Lakhs)
2. Preparation of Fire Safety Manual for NDMA, New Delhi (National Disaster Management Authority, New Delhi, Rs. 0.00 Lakhs)
3. Social Cost Benefits Analysis of the Proposed Coal Mine at Chhendipada Tehsil of Angul District, Odisha (Radhikapur (West) Coal Mining Ltd., Rs. 4.49 Lakhs)
4. Social Impact Assessment for the Proposed Project Location in West Midnapore (ACC Limited, Rs. 3.58 Lakhs)

**Visits Abroad by Faculty Members**

1. Roy, Anjali - Academic Visitor (University of Technology at Sydney, Sydney Australia, ) 5-8 September 2012
3. Goswami, Kishor - To present project progress report (Colombo, Sri Lanka, ) One week
4. Srivastava, Kailash Bihari Lal - To attend International Conference on Psychology (Cape Town, South Africa, ) 22-26 July 2012
6. Pradhan, Rabindra Kumar - Advanced Research Training Seminar (University of Stellenbosch, Stellenbosch, South Africa, ) 17-19 July 2012
7. Chatterjee, Bani - To inter act with Director, faculty and students for future collaboration (Thomas Bata University Zlin, Czech Republic, ) Oct 22nd to Nov 10th, 2012
10. Roy, Anjali - Deliver a lecture (University of Western Australia Perth Australia, ) 9-10 September 2012
11. Suar, Damodar - Present papers in IUPSs (Cape Town, South Africa, ) July 2012
Invited Lectures by Faculty Members

1. Corporate Response to Economic Reforms in India: Emerging Patterns and Trends by Mishra, Pulak (Asian School of Business Management, Bhubaneswar)
2. Relevance of Managerial and Business Economics for the Students of Business Management by Mishra, Pulak (Sri Sri University, Cuttack)
3. Estimation of Limited Dependent Variable Models by Mishra, Pulak (Vidyasagar University, Midnapur)
4. Impact of FDI Inflows on Innovation and Growth: Experience of Indian Manufacturing Sector by Mishra, Pulak (Kharagpur College)
5. Emotional Intelligence and Organizational Excellence: A Global Business Perspective by Pradhan, Rabindra Kumar (PG Dept of Master of Business Administration, Sambalpur University, Odisha, India)
6. Attitude Matters at Work by Pradhan, Rabindra Kumar (PXE, DRDO, Ministry of Defence, Govt of India, Chandipur, Odisha)
7. Executive excellence through EQ by Pradhan, Rabindra Kumar (United School of Business Management, Bhubaneswar, Odisha)
8. Interpersonal Communication by Pradhan, Rabindra Kumar (PXE, DRDO, Ministry of Defence, Govt of India, Chandipur, Odisha)
9. Emotional Intelligence by Pradhan, Rabindra Kumar (PXE, DRDO, Ministry of Defence, Govt of India, Chandipur, Odisha)
10. What are the Posts You Tether Indianness To by Komalesha, H. S. (Bharatiya Vidya Bhavan's Arts College - Ahmedabad)
11. Towards a More Meaningful and Goal-based Study of English in our Colleges by Komalesha, H. S. (D K College, Jaleswar)
12. Travels of the Dastaan from Qissa Khwani Bazaar to Bombay by Roy, Anjali (IISc Bangalore)
13. Swami Vivekananda on Empowerment and Women of India by Chakraborti, Chhanda (Netaji Subhash Institute of Asian Studies, Kolkata)
14. Swami Vivekananda: Some Reflections by Chakraborti, Chhanda (Department of History, Calcutta University)
15. What are Humanities and Social Sciences Doing in IIT Kharagpur? by Roy, Anjali (PEC Chandigarh)
16. The Magic of Bollywood: At Home and Abroad by Roy, Anjali (UWA, Perth, Australia)
17. Bollywoods Soft Power by Roy, Anjali (Christ University Bangalore)
18. Effective communication by Patnaik, Priyadarshi (IIT Patna)
19. Virtual Communication and Language Teaching by Chakraborty, Jayshree (Padnava College of Engineering Rourkella)
20. Genres-based Writing by Chakraborty, Jayshree (Calcutta University)
21. Adaptive Innovation Paradigm:Global Issues And Challenges by Chatterjee, Bani (Tomas Bata University,Zlin,Czech Republic)
22. Business In India by Chatterjee, Bani (Thomas Bata University,Zlin,Czech Republic)
23. SHG to successful entrepreneur: Strategic analysis in the light of challenges and opportunities by Suar, Damodar (Post harvest technology centre, IIIT Kharagpur)

Books Published

2. Dr. Uday Kumar Haldar,Dr. Rabindra Kumar Pradhan,Mr. Arun Ray Choudhury & Ms. Juthika Sarkar: Value Creation through Human Development: The Emerging Dimension published by Indian Society for Training and Development, New Delhi (2012)

**Short-Term Courses, Training Programmes and Workshops organised**

1. Essentials of Writing (August 2 - 8, 2012)
2. The Futural Critical Constellations:The Cultural politics of the Neo-empire (5 Days)

**Papers Published in Journals**


40. Transformational leadership, organizational effectiveness, and programme outcomes in non-


Papers Presented in Conferences


4. Can changing climate be reversed and/or halted without radically transforming the human psyche?, By Behera, B, Transforamtion in a Changing Climate, University of Oslo in Norway, (2013)


17. Is the average person better (worse) than similar others in a socially desirable(undesirable) trait?, By Suar, D., Mishra, S., & Mishra, S., XXII Annual Convention of the National Academy of Psychology (NAOP) India, Christ University Bangalore, India. (2012)
18. Karma-Yoga (Spirit at work) and job attitudes: Applying Indian wisdom to today’s business problems, By Sajeet Pradhan & Rabindra Kumar Pradhan, IIMK HR Summit., IIM Kozhikode, Kerala, (2013)
23. Patachitra as a Sustainable Art(invited Paper), By Roy, Anjali Gera, Values and Practices to Foster Sustainable Communities. February Dialogues.Meeting Rivers Programme of Pipal Tree (Bangalore, India) and Dialogues en Humanite (Lyon, France), Fireflies Bangalore, (2013)
26. Representation of Sikhs in Bollywood Cinema(invited paper presented in absentia), By Roy, Anjali Gera, Sikh(sm), Literature and Film Conference, Hofstra University, (2012)
Department of Industrial Engineering & Management

**Head**
Prof. Manoj Kumar Tiwari   from 01.01.2013

**Professors**
Acharya, Damodar          Ph.D.(IIT Kharagpur),
Banerjee, Rabindra Nath   PGDM (Edinburgh UK),
Mahanty, Biswajit         Ph.D.(IIT Kharagpur), System Dynamics, Operations
                          Research, Information Systems, Project Management
Mohapatra, Pratap Kumar   Ph.D.(IIT Kharagpur), System Dynamics and Systems Thinking, E-
Jagadev                   Business and E-Governance, Production and Operations
                          Management, Quality Engineering and Control, Quantitative Methods
Ray, Pradip Kumar         Ph.D.(IIT Kharagpur), Ergonomics/Human Factors
                          Engineering, Quality Design/Quality Management, Operations and
                          Environmental Management, Optimization of Engineering/Service
                          Systems
Sahu, Sadananda           Ph.D.(IIT Kharagpur), 1.Industrial Engineering 2.Supply Chain
                          Management 3.Productivity management
Srinivasan, S             Ph.D.(IIT Kharagpur), Financial Engineering
Tiwari, Manoj Kumar       , Manufacturing Planning and Scheduling, Logistics and Supply Chain
                          Analysis, Computational Intelligence in Manufacturing and
                          Logistics, Optimisation and Simulation

**Associate Professor**
Maiti, Jhareswar          Ph.D.(IIT Kharagpur), Safety engineering and
                          management, Engineering ergonomics and worksystem
                          design, Quality engineering and management, Data Analytics

**Assistant Professors**
Jenamani, Mamata          Ph.D.(IIT Kharagpur), Information System, E-Business
Jha, Jitendra Kumar       Ph.D.(IIT Kanpur), Supply Chain Management, Inventory
                          Control, Facility Location
Kumar, Akhilesh           Ph.D.(Wayne State Univ., USA), Reverse Logistics, Supply Chain
                          Management, Autonomous Diagnostics & Prognostics, Condition-
                          Based Maintenance, Computational Intelligence Data Mining Complex
                          Systems Evolutionary Computing
Thakkar, Jitesh J         Ph.D.(IIT Delhi), Supply Chain Management, Lean
                          Manufacturing, Project Management, Service Operations
                          Management, Quality Control and Management

**Faculty Appointments**
Jitendra Kumar Jha        Assistant Professor
Jitesh J Thakkar          Assistant Professor
Dr. Shri Krishna Kumar    Assistant Professor

**Brief Description of on-going activities**

Since its inception the department has been known across the nation for its excellent research potential and capability in the field of industrial engineering and related areas. As a matter of fact, pioneering research in the following areas of industrial engineering and management are being carried out: Operations Management: Production Planning and Inventory Control, Logistics and

**Thrust Areas**

1. Manufacturing and Supply Chain Management
2. Industrial Analytics
3. Production, Planning and Control
4. Human Factor and Safety Engineering
5. Optimization and Simulation
6. Quality Engineering

**Lectures by Visiting Experts**

1. Digital Manufacturing, life cycle modelling by Prof. Darek Ceglarek (Warwick Manufacturing Group, UK)
2. Strategic Management by Dr. PVN Nambiar (TATA STeel)
3. Agribusiness and Supply chain integration by Prof. Surya Pande (Institute for Business Research: University of Waikato, New Zealand)

**Doctoral and MS Degrees Awarded**

2. Lalit Mohan Jha: Adoption of Enterprise Resource Planning System in Indian Army (Ph.D.)
4. Purushottam Lal Meena: Sourcing Decisions under the Risks of Supply Disruption and Supplier Satisfaction (Ph.D.)
5. Ajay Pathak: Basel-II risks model development and implementation issues for a Public Sector Bank of India (Ph.D.)

**Member - Professional Bodies**

1. Maiti, Jhareswar, Regular life member - Operational Research Society of India
2. Maiti, Jhareswar, Senior life member - Indian Society for Technical Education
3. Maiti, Jhareswar, Senior life member - Mining, Geological and Metallurgical Institute of India
4. Maiti, Jhareswar, Senior life member - Society for Safety and Fire Engineering
5. Sarmah, Sarada Prasad, Regular - AIMS International; The Association of Indian Management Scholar, Houston, USA
6. Sarmah, Sarada Prasad, Life member - ISTE
7. Jenamani, Mamata, Member - Association for information systems research
8. Jenamani, Mamata, Regular - IEEE
9. Tiwari, Manoj Kumar, member - Member of INFORMS, US
10. Tiwari, Manoj Kumar, Member - Institute of Industrial Engineers, USA
11. Tiwari, Manoj Kumar, Member - Fellow of National Academy of Engineering, India
12. Tiwari, Manoj Kumar, Member - Member of IEEE, US
13. Thakkar, Jitesh J, Member - Indian Institute of Industrial Engineering
14. Thakkar, Jitesh J, Member - The Institution of Engineers (India)
15. Jha, Jitendra Kumar, Member (MIIE 9520) - Indian Institution of Industrial Engineering Navi Mumbai
16. Jha, Jitendra Kumar, Life Member - Indian Society for Technical Education
17. Srinivasan, S, - Member of American Financial association
18. Ray, Pradip Kumar, Fellow - World Academy of Productivity Sciences(WAPS)
19. Ray, Pradip Kumar, Member - Indian Institute of Materials Management (IIMM), Calcutta, India
20. Ray, Pradip Kumar, Regular - INFORMS, USA
21. Mahanty, Biswajit, Life member - System Dynamics Society of India

**Member - Editorial Board**

1. Maiti, Jhareswar (0) Reviewer - Computer and Industrial Engineering
2. Maiti, Jhareswar (0) Reviewer - Journal of Production Research
3. Maiti, Jhareswar (0) Reviewer - Accident Analysis and Prevention
4. Maiti, Jhareswar (0) Reviewer - Safety Science
6. Tiwari, Manoj Kumar (2012) Associate Editor - Neurocomputing
8. Tiwari, Manoj Kumar (2013) Associate Editor - International Journal of Production Research
15. Tiwari, Manoj Kumar (2011) Associate Editor - Journal of Computers and Industrial Engineering
20. Tiwari, Manoj Kumar (2007) Associate Editor - Journal of Intelligent Manufacturing

**Awards & Honours**

5. Tiwari, Manoj Kumar (2013) Fellow of National Academy of Engineering, India
6. Kumar, Akhilesh (2010) Finalist for Best Student Paper Award, INFORMS Annual Conference, Austin, TX
7. Tiwari, Manoj Kumar (2009) Listed among top 20 most productive authors in the broad area of Production and Operations Management in the last 50 years (Published in IJPE, 2009)
9. Tiwari, Manoj Kumar (2012) Rated 2nd among many researchers working in Logistics and Supply Chain Management in India(Analysis of the logistics Research in India-White paper published in TU Dortmund University, Dortmund Germany
Fellowships

2. Ray, Pradip Kumar (2012) Invited Fellow at the Department of Industrial Management, National Taiwan University of Science and Technology (NTUST), Taipei, Taiwan

Sponsored Research Projects

1. A Comparative Assessment of Performance of Select Institutes of Higher Education (Indian Council of Social Science Research (ICSSR), Rs.9.00 Lakhs)
2. A Strategic Capacity Management Framework for Remanufacturing in the Indian Automotive Industry (SRIC, IIT KGP, Rs.4.98 Lakhs)
3. Bid Evaluation, Contract Finalization and Overview of Implementation of SAP-IS Utilities (Central Electricity Supply Utility of Orissa, Bhubaneswar, Rs.0.00 Lakhs)
4. Climate Change Issues and Environmental Performance of Small and Medium Sized Enterprises in India and the UK (UKIERI, Rs.35.00 Lakhs)
5. Data driven sustainable and resilient safety management system for Tata Steel Jamshedpur (Tata Steel, Jamshedpur, Rs.25.68 Lakhs)
6. Designing a Responsive and Efficient Supply Chain for Perishable Items (SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
7. Developing comprehensive supply chain performance indices and benchmarks for Indian industry (SRIC, IIT Kharagpur, Rs.4.00 Lakhs)
8. ERP System for the Institute (IER) (IIT Kharagpur, Rs.51.00 Lakhs)
9. Organizational Asset Maturity Model (Tata Consultancy Services, Mumbai, Rs.0.00 Lakhs)
10. Strategic Options Study for Rural Roads under R. D. Department (Government of Orissa, Rs.0.00 Lakhs)
11. Technical Audit of Center for Jute Machinery Development (National Jute Board, Kolkata, Rs.0.00 Lakhs)
12. Virtual Lab for Simulation and Gaming (MHRD, Rs.52.00 Lakhs)
13. Vision 2030 of State Pollution control Board, Orissa (State Pollution Control Board, Bhubaneswar, Orissa (2011), Rs.0.00 Lakhs)

Consultancy Projects

1. To Study, design, develop, install, test, commission, implement the Web based Reverse Auction Software in NLC Ltd for Neyveli Lignite Corporation (Neyveli Lignite Corporation Limited, Rs.27.00 Lakhs)
2. Assessment of Future Human Capital Requirements in Agriculture (NAARM, Hyderabad, Rs.3.00 Lakhs)
3. Assessment of residual reliability of armoured fighting vehicles through CBM (AFVC) (Military College of Electronics and Mechanical Engineering Hyderabad, India, Rs.13.50 Lakhs)
4. Computerization of Corporate Contracts Management System for NLC (Neyveli Lignite Corporation, Rs.260.00 Lakhs)
5. Decision Support Model for Optimizing Bulk Material Handling Operations (Dhamra Port Corporation Ltd. Orissa, Rs.11.00 Lakhs)
6. Design and Supervision of Central SLIVER Plant, Chowdar, Orissa (Khadi and Village Industries Commission, Mumbai, Rs.0.00 Lakhs)
7. Hazard Identification and Risk Assessment of Industrial Activities in the Integrated Test Range, Chandipur (DRDO, Rs.9.00 Lakhs)
8. Implementation of Reverse Auction Software in NLC (Neyveli Lignite Corporation Limited, Rs.29.34 Lakhs)
9. Logistics Solver for Route Optimization and Truck Load Capacity Planning for Proctor & Gamble India Limited (Proctor & Gamble India Limited, Rs.3.00 Lakhs)

11. Reservoir Characterization using Artificial Intelligent Techniques (Soft Computing) (ONGC, Rs.45.00 Lakhs)

12. Studying and analyzing carbon trading regime for Global Collaborative Supply Chain (ACTR) (The University of Sheffield, UK, Rs.1.18 Lakhs)

Visits Abroad by Faculty Members

1. Ray, Pradip Kumar - Workshop/Interaction Meeting as CI of UKIERI-sponsored Project (Aston Business School, Aston University, Birmingham, UK, ) November 5-9, 2012
2. Tiwari, Manoj Kumar - Delivered lecture and research discussion in imerging area (School of Business and Economics, University of Exeter, Exeter, UK, )
3. Tiwari, Manoj Kumar - Attended the conference and collaborative research (Warwick Manufacturing Group, University of Warwick, )
4. Ray, Pradip Kumar - To Teach TQM module for Post-Graduate Sudies Programme (PNG UNRE, Rabaul, Papua New Guinea, ) June 18-22, 2012
5. Ray, Pradip Kumar - To Teach TQM module for Post-Graduate Sudies Programme (PNG UNRE, Rabaul, Papua New Guinea, ) March 18-22, 2013
6. Ray, Pradip Kumar - Visiting Fellow at the Department of Industrial Management (National Taiwan University of Science and Technology (NTUST), Taipei, Taiwan, ) May 15-18, 2012
7. Mahanty, Biswajit - To present a paper in the International Conference KOMPLASTECH-2013 (Zakopane, Poland, ) January 12-17, 2013

Invited Lectures by Faculty Members

1. Delivered a key note to address Self Healing in Supply Chain Management by Tiwari, Manoj Kumar (IIT Delhi)
2. Key note speaker in International Conference on Swarm Evolutionary and Memetic Computing Conferen by Tiwari, Manoj Kumar (SOA University, Bhubaneswar, Odisha)
3. Key note speaker in International Conference on Best Practices in Supply Chain Management (BPSCM) by Tiwari, Manoj Kumar (CMIA Business Conference on Industrial Automation, Aurangabad)
4. Project Scheduling by Sarmah, Sarada Prasad (Mc Nalley Bharat Ltd. Kolkata)
5. Logistics and Supply Chain Management in Infrastructure Business by Thakkar, Jitesh J (Adani Institute of Infrastructure Management, Ahmedabad)
6. Process Safety Management: Where are we and what should we do? by Maiti, Jhareswar (Tata steel Jamshedpur)
7. Kaizen in Professional Life by Ray, Pradip Kumar (Production Engg Department, Jadavpur University, Calcutta)
8. Design for Safety’ and ‘Ergonomics by Ray, Pradip Kumar (Mechanical Engineering Department, Jadavpur University, Calcutta)
9. Leadership Excellence – Role of Human Asset by Ray, Pradip Kumar (Central University of Rajasthan, Bandar Sindri, Rajasthan)
10. Statistics: Concepts and Methods’ by Ray, Pradip Kumar (Metallurgical and Material Engineering Department, Jadavpur University, Calcutta)
11. DOE: Concepts and Methods by Ray, Pradip Kumar (Metallurgical and Material Engineering Department, Jadavpur University, Calcutta)
12. Robust Design and Taguchi Method by Ray, Pradip Kumar (Metallurgical and Material Engineering Department, Jadavpur University, Calcutta)
13. Analytics in Manufacturing/Production Systems: Opportunities and Challenges by Ray, Pradip Kumar (Production Engineering Department, Jadavpur University, Calcutta)
15. Intelligent Manufacturing by Mahanty, Biswajit (ITR Chandipur)
Books Published

1. Lyes Benyoucef, Jean-Claude Hennet and Manoj Kumar Tiwari: Multi-criteria and Game theory Application in Manufacturing and Logistics published by Springer (2013)

Short-Term Courses, Training Programmes and Workshops organised

1. A Course on Lean Manufacturing for managers of different companies ()
2. Conducted a Course on PLM/PDM for DRDO Professionals ()
3. Decision modeling in Facility Planning (4-8 July 2011)
4. Facility Layout and Decision Modeling (04.07.2011 to 08.07.2011)
5. Industrial safety engineering (December 22-24, 2012)
6. One-Day Duration Seminar on “SME Performance – Quality and Environmental Sustainability” (September 26, 2012)
7. One-Day Workshop on ‘Asset Management for Railway Systems: Opportunities and Challenges (February 1, 2013)
8. Project Management (24-26 February 2012)
9. Project Management (11-14 May 2013)
10. Reconfigurable Manufacturing System for Faculty members of different Technical Institutes (One week)
11. Short-Term Course on ‘Industrial Safety Engineering’ for Industry Participants (December 21-23, 2012)
12. Total Quality Management (16-18 September 2011)

Papers Published in Journals


34. Supply chain performance measurement for third party logistics By Dhanya, J. Sarmah S P Benchmarking: An international Journal Accepted (2013)

Papers Presented in Conferences

1. A decision support system to combat underground mine fire using Bayesian networks, By Vishal Kumar, S Gupta and J Maiti, National Symposium on Present Technology and Safety Scenario in Mining & Allied Industries., IIT, BHU, (2013)
Department of Mathematics

Head
Prof. Parmeshwary Dayal Srivastava

Professors
Bhattacharyya, Somnath  Ph.D.(IIT Sc Bangalore), Computational Fluid Dynamics, Micro-/nanofluidics Modeling
Goswami, Adrijit  Ph.D.(Jadavpur Univ), Operations Research and Theoretical Computer Science
Gupta, Dharmendra Kumar  Ph.D.(IIT Kharagpur), Numerical Analysis and Computer Science, Constraint Satisfaction Problems
Gupta, Umesh Chandra  Ph.D.(IIT Delhi), Statistics, Stochastic Modelling, Queueing Theory
Jain, Vinay Kumar  Ph.D.(IIT Delhi), Zeros of polynomials and analytic functions & Extremal problems of polynomials
Kumar, Somesh  Ph.D.(IIT Kanpur), Reliability Estimation, Statistical Decision Theory, Entropy Estimation, Estimation Theory, Quantum Information and Computation, Statistical Data Analysis, Experimental Designs, Estimation under Constraints
Pandey, Rajnikant  Ph.D. Differential Equations (Ordinary), Theoretical Numerical Analysis, Singular Boundary Value Problems
Raja Sekhar, G P  Ph.D.(Hyderabad Univ), Boundary integral methods for viscous flows, Mass transfer in porous biologocal pellets
Roy, Akhil Ranjan  Ph.D.(IIT Kharagpur), General Th.of Realativity, Theoretical Cosmology, Algebra and Application of Soft Set theory, Dynamics of Nonlinear Systems
Sarkar, Anjan  Ph.D.(IIT Kharagpur), Probabilistic Robotics, Remote Sensing Image Analysis, Statistics
Srivastava, Parmeshwary Dayal  Ph.D.(IIT Kanpur), Functional Analysis & Cryptography

Associate Professors
Kumar, Pawan  Ph.D.(IIT Kanpur), Graph Theory
Murthy, P V S N  Ph.D., Bio-fluid Mechanics, Convective Heat and Mass Transfer in nano fluid
Panda, Geetanjali  Ph.D., Optimization with uncertainty, Convex Optimization, Numerical Optimization

Assistant Professors
Allu, Vasudeva Rao  Ph.D.(IIT Madras), Univalent Function Theory, Harmonic Mappings (in the Plane), Complex Analysis
Biswas, Debapriya  Ph.D.(Leeds Univ), Functional Analysis, Lie Groups Lie Algebras and their Representation theory, Complex Analysis, Harmonic Analysis
Dutta, Ratna  Ph.D.(ISI, Kolkata), Disruption Tolerant Networks (DTNs), Key Pre-Distribution in WSN, Oblivious Transfer & Private Information Retrieval, Elliptic Curves and Pairing based Cryptography, Private Set Intersection Protocols, Vehicular Ad Hoc Network, Lattice-Based Cryptography
Ganguly, Asish  Ph.D.(Calcutta Univ.), Mathematical & Theoretical Physics, Quantum
Mechanics, Dynamical System, Fluid, Non-linear Evolution Equation in Real & Complex Domain

Gayen, Rupanwita  
Ph.D. (Univ of Calcutta), Linear water waves, Integral equations

Ghoshal, Koeli  
Ph.D. (Jadavpur Univ.), Mathematical Modelling of velocity and concentration in an open channel turbulent flow, Grain-size distribution in suspension over erodible sediment bed, Effect of secondary current on velocity and concentration, Application of Beta Gamma and Psi function in sediment transport problem, Verification of the developed models by existing experimental data

Kumar, Jitendra  
Ph.D. (Univ. of Magdeburg, Germany), Numerical mathematics, Numerical solutions of integro-partial differential equations

Mukhopadhyay, Sourav  
Ph.D. (ISI, Kolkata), Digital rights management, Cryptanalysis on symmetric cipher, Key management in wireless adhoc network, Traitor-Tracing in broadcast encryption, Key Pre-Distribution (KPS) in sensor network

Nelakanti, Gnaneshwar  
Ph.D. (IIT Bombay), Inverse and ill-posed problems, Spectral approximation of integral operators, Approximate solutions of operator equations

**Faculty Appointments**

Prof. B. Bhowmik  
Assistant Professor

Prof. Nitin Gupta  
Assistant Professor

Prof. T. Raja Sekhar  
Assistant Professor

**Faculty Retirement**

Prof. Anjan Sarkar  
Professor

Prof. A.R. Roy  
Professor

**Faculty Re-employment**

Prof. A.R. Roy  
Professor

Prof. Anjan Sarkar  
Professor

**New Academic Programmes**

The Department has not introduced any new program. However, the Department is in the process of reviewing its already existing programs though a change of course content of different topics as per the present day requirements

**Brief Description of on-going activities**

Besides extensive research in the thrust areas viz. Functional Analysis and Fluid Mechanics, significant contribution has also been made by the members of the faculty in the area of Clifford Analysis, Fuzzy Mathematics, Soft Algebra, Bio-Mechanics, Dynamics of Nonlinear systems, Inventory Management, Graph Theory, Integral Equations, Cryptography, Queueing Theory, Statistical Decision Theory, Statistical Data Analysis, Compiler Design, Combinatorics, Fractional Calculus, Optimization Theoretical Computer Science; Information and coding Theory and Cryptology. Faculty members of this department have published number of research papers in reputed international journals on those topics. Number of sponsored research projects are under taken by the faculty members.
Thrust Areas

1. Fluid Mechanics and Functional Analysis

New Acquisitions

1. Dell Blade Servers - 2 Units
2. Lenovo Desktop computers - 10 Units
3. Dell Desktop computers - 50 units
4. Online UPS 10 KVA - 2 Units
5. Online UPS 20 KVA - 1 Unit

Lectures by Visiting Experts

1. Quasi Conformal mapping and Variational Formulas in Function Theory by Prof. Hiroshi Yanagihara (Professor of Mathematics, Department of Applied Sciences, Yamaguchi University, Japan)
2. (a) On homogenization, diffusion and reaction in porous media. (b) On Modelling of Material Behaviour of Steel under Cooling by Prof. Michael Böhm (Department of Mathematics and Computer Sciences at the University of Bremen, Germany)
4. An unbiased approach to linear repression analysis by Prof. P. Vellaisamy (Department of Mathematics, IIT Bombay)
5. Selecting the better of two gamma populations having unequal shape parameters by Prof. Neeraj Misra (Department of Mathematics and Statistics, IIT Kanpur)
6. A Trip through Fluidic Interfaces in Compressible Fluid Flow: Shock Waves, Contact Waves and Phase Transitions by Prof. Christian Rohde (Professor & Chair, Department of Mathematics, Institute for Applied Analysis and Numerical Simulation, University of Stuttgart, Germany)
7. (a) An Introduction of Functional Analysis -II-III. (b) A new sequence space $\kappa_{p}(f)$ Derived from an $L_{p}$ function. by Prof. Hiroshi Sato (Emeritus Professor of Mathematics, Kyushu University, Japan)
8. Linearity of the sequence space $\Lambda_{p}(f)$ by Prof. Honda Aoi (Professor of Mathematics, Department of System Design & Informatics, Kyushu Institute of Technology, Japan)
9. Stochastic Models and Matrix-analytic methods by Prof. Srinivas R. Chakravarthy (Professor, Department of Industrial and Manufacturing Engineering, Kettering University, USA)

Doctoral and MS Degrees Awarded

1. Om Prakash: Some Deterministic and Probabilistic Models in Production Planning and Inventory Control (Ph.D.)
2. Sushomita Mohanta: Some Aspects of Scalar & Vector Valued Sequence Spaces of Fuzzy Numbers using Modulus Function (Ph.D.)
3. Ravi Shankar Kumar: Mathematical Modelling of Inventory Control Problems in Fuzzy Random Environment (Ph.D.)
5. Laxman Saha: Theoretic and Algorithmic Results on Radio k-Coloring of Graphs (Ph.D.)

Member - Professional Bodies

1. Murthy, P V S N, Member - American Nano Society
2. Ganguly, Asish, Category S Member - American Mathematical Society USA
3. Srivastava, Parmeshwary Dayal, Member - National Academy of Science, India
4. Gupta, Dharmendra Kumar, Member - National Academy of Sciences
5. Kumar, Somesh, Elected Life Member - National Academy of Sciences
6. Chakraborty, Debjani, Member - Indian National Academy of Science, Allahabad
7. Allu, Vasudeva Rao, - Member of American Mathematical Society (Since January 2011)

**Member - Editorial Board**

1. Biswal, Mahendra Prasad (2008) Member of Editorial Board - Mathematical Reviews

**Awards & Honours**

2. Bhattacharyya, Somnath (1997) BOYSCAST Fellowship, DST
4. Bhattacharyya, Somnath (2010) DFG, Germany Fellowship
5. Allu, Vasudeva Rao (2007) Distinguished CIMO (Center of International Mobility) Fellowship from Ministry of Education, Finland
7. Bhattacharyya, Somnath (2006) HWK, Germany Fellowship
8. Raja Sekhar, G P (2002) INSA (Indian National Science Academy) Young Scientist Award
9. Chakraborty, Debjani (1997) ISCA Young Scientist Award in Mathematics
15. Allu, Vasudeva Rao (2007) Received Best Paper Award at 22nd Annual conference of Ramanujan Mathematical Society
18. Biswas, Debapijya (2011) Visiting Research Fellow, University of Leeds, UK

**Fellowships**


**Sponsored Research Projects**

1. A Study on Quantum System with Position-dependent mass in the context of Hermitian/Non-Hermitian Interaction (ISIRD, SRIC, IIT KGP, Rs.3.10 Lakhs)
2. Classification of the actions of semi-simple Lie groups on homogeneous spaces. (SRIC, IIT Kharagpur (ISIRD) (duration 3 years), Rs.1.65 Lakhs)
3. Coefficient bounds, distortion condition for subclasses of univalent functions and Nitsche type conjectures for harmonic univalent functions (ISIRD, SRIC, IIT Kharagpur, Rs.3.70 Lakhs)
4. Construction of Boolean Functions to Design Cryptographically Secure Stream Cipher (ISIRD, SRIC, IIT-KGP, Rs.5.00 Lakhs)
5. Continuous and periodic review inventory model in Fuzzy and/or Stochastic Environment (Department of Science & Technology, Rs.13.00 Lakhs)
6. Designing ABE Schemes for Fine-Grained Access Control in DTNs (ISIRD, SRIC, IIT-KGP, Rs.5.00 Lakhs)
7. Electro-osmotic Flow and Mixing in a charged Micro and Nano-Channels: A Computational and Analytical Study (DST, Rs.0.00 Lakhs)
8. Elliptic curves and pairing based cryptography for wireless communication. (Department of Science & Technology(DST), Government of India., Rs.10.92 Lakhs)
9. FIST (DST, Rs.2000000.00 Lakhs)
10. Localization and Navigation Using Semantics(thematic), Second year (European Aeronautics Defence Space Company, Rs.46.82 Lakhs)
11. Modeling Electrokinetic Flows in Microfluidics (CSIR, Rs.0.00 Lakhs)
12. MODELLING OF AGGREGATION KERNELS OF POPULATION BALANCE EQUATION FOR FLUIDIZED BED GRANULATION ON THE BASIS OF MONTE CARLO SIMULATIONS (ISIRD, SRIC, IIT KHARAGPUR, Rs.4.40 Lakhs)
13. On a class of doubly singular boundary value problems arising in Physiology (DST, New Delhi, Rs.8.24 Lakhs)
14. WAVE INTERACTION WITH BARRIERS AND FLOATING ELASTIC PLATES (DST, Rs.11.00 Lakhs)

Visits Abroad by Faculty Members

1. Sarkar, Anjan - Project work (EADS), Delivering lectures (Munich Germany, ) 26-30 June 2013
5. Panigrahi, Pratima - To present a paper in an international conference. (London, UK, ) 2-7 July 2012
6. Ghoshal, Koeli - To present seminar in International conference on Fluids Engineering(ICFE-2012) (Paris, France, ) 7 days

Invited Lectures by Faculty Members

1. Existence of Solution of Nonlinear Interval Optimization problem by Panda, Geetanjali (Bhubaneswar)
2. Interval Newton method by Panda, Geetanjali (Berhampur University)
3. Zabreikos result and its applications fo functional analysis by Nahak, Chandal (OMS, Sambalpur University)
4. Algoritms on Radio coloring of Graphs by Panigrahi, Pratima (Raja N. L. Khan Womens College, Midnapore)
5. On unit distance strongly regular graphs by Panigrahi, Pratima ( V V V College, Virudhunagar, near Madurai, TN.)
6. Introduction to Operations Research by Biswal, Mahendra Prasad (KIIT Bhubaneswar)
7. A third order itertaion for A+ by Gupta, Dharmendra Kumar (ISM Dhanbad)
8. Magnetic drug targeting in a micro vessel by Murthy, P V S N (Christ University, Bangalore)
9. Estimating parameters under restrictions by Kumar, Somesh (Indian Statistical Institute, Chennai)
10. Fascinating world of numbers by Kumar, Somesh (NIT Durgapur)
11. Rigorous estimates for Oseen-Brinkman transmission problem by Raja Sekhar, G P (University of Hyderabad, India.)
12. Towards Boundary element methods for porous media flows by Raja Sekhar, G P (IIT Hyderabad, India)
Papers Published in Journals


24. Double layer polarization and non-linear electroosmosis in and around a charged permeable aggregate By P. P. Gopmandal and S. Bhattacharyya *World Academy of Science, Engineering & Technology* 69, 1088-1094 (2012)


31. Estimation of the dynamic permeability of an assembly of permeable spherical porous particles using the cell model By Jai Prakash, Raja Sekhar, G. P *Journal of Engineering Mathematics* DOI 10.1007/s10665-0 (0)


34. Fuzzy inventory models for items with imperfect quality and shortage backordering under crisp and fuzzy decision variables By Gour Chandra Mahata, Adrijit Goswami *Computers & Industrial Engineering* 64, 190 - 199 (2013)


38. Generalized ideals with triangular norm By G. Panda, S. Nanda, M. Panigrahi *Journal of Advanced Mathematical Studies* in press (0)


40. Generalized$\rho$-$(\eta, \theta)$-Convexity and Generalized$\sigma$-$(\eta, \sigma)$-Monotonicity By N. Behera, C. Nahak and S. Nanda *Indian Journal of Industrial and Applied Mathematics* 3(1), 74-86 (2012)

41. Generalized$\rho$-$(\eta, \theta)$-Convexity and Generalized$\sigma$-$(\eta, \sigma)$-Monotonicity By N. Behera, C. Nahak and S. Nanda *Indian Journal of Industrial and Applied Mathematics* 3(1), 74-86 (2012)


65. Some remarks on Matrix exponential and Matrix logarithm (communicated). By Debapriya Biswas (0)


70. Thermocapillary drift on a spherical drop in a viscous fluid By Choudhuri, D., Raja Sekhar, G. P. Physicals of Fluids In Press. (0)


73. Velocity distribution in open channels: Combination of log-law and parabolic law By Snehasis Kundu and Koeli Ghoshal World Academy of Science, Engineering and Technology 68, pp 1735-1742 (2012)

Papers Presented in Conferences


4. Classification into two normal populations with a common mean and unequal variances, By N. Jana and Somesh Kumar, International Conference on Optimization Modeling and Applications, University of Delhi, Delhi, (2012)


8. LHSC : An effective dynamic key management scheme for linear hierarchical access control, By Vanga Odelu, Ashok Kumar Das, Adrijit Goswami, IEEE international conference on Communication Systems and Networks (COMSNETS 2013), Bangalore, India, (2013)


11. Some decision theoretic aspects on the estimation for the mean direction of a Langevin model, By Kanika and Somesh Kumar, International Conference on Optimization Modeling and Applications, University of Delhi, Delhi, (2012)

12. The Double diffusive free convection flow past an inclined plate in non-Darcy porous medium saturated with nanofluid, By Abhijit Sutradhar and P V S N Murthy, 57th Congress of ISTAM, DIAT Pune, (2012)
Department of Mechanical Engineering

Head
Prof. Ranjan Bhattacharyya

Professors
Bhattacharyya, Ranjan  Ph.D.(Kentucky), Nonlinear Elasticity, Vibration, Dynamical Systems
Bhattacharyya, Sati Nath  Ph.D.(IIT Kharagpur), Fluid Mechanics
Bhattacharyya, Souvik  Ph.D.(Texas A & M), Thermal science, Natural refrigerant based transcritical heating cooling systems, Thermodynamic optimization, Natural circulation loops (NCLs), Energy Engineering
Chakraborty, Suman  Ph.D., Microfluidics and Nanofluidics, Interfacial Phenomena and Phase Change, Computational Fluid Dynamics (CFD)
Chatterjee, Anindya  Ph.D.(Cornell University), Applied mechanics, Dynamics
Chattopadhyay, Ajay Kumar  Ph.D.(Jadavpur Univ), Metal-Ceramic Joining, Machining, Grinding, Surface Coating
Das Gupta, Anirvan  Ph.D.(Kanpur), Wave propagation, Dynamics of discrete and continuous systems, Mechanics of membranes, Vibration induced particle transport
Dash, Sukanta Kumar  Ph.D.(IIT Kharagpur), pressure drop in gas solid flow, free surface flow
Guha, Abhijit  Ph.D.(Cambridge),
Maiti, Biswajit  Ph.D.(IIT Delhi),
Maiti, Rathindranath  Ph.D.(IIT Kharagpur), Mechanical and Fluid Power Transmission and Gear Engineering, Mechanical and Fluid Power Transmission and Gear Engineering
Mukherjee, Amalendu  Ph.D.(IIT Kharagpur), System Dynamics and Controls
Nath, Ashish Kumar  Ph.D.(Bombay University), Laser material interaction and processing, Underwater laser processing, Nontraditional manufacturing processes
Paul, Soumitra  Ph.D.(IIT Kharagpur), Machining and Grinding, Cutting Tool Coating
Pratihar, Dilip Kumar  Ph.D.(IIT Kanpur), Soft Computing, Robotics, Manufacturing Science
Ray, Manas Chandra  Ph.D.(IIT Kharagpur), Fuzzy Fiber Reinforced Composites, Smart Structures, Composite Structures, Nanocomposites, Fluid-structure interaction, Active constrained layer damping
Roy Chowdhury, Samar Kumar  Ph.D.(Birmingham), Tribology Bio-Tribology Nano-Tribology
Som, Sankar Kumar  Ph.D.(IIT Kharagpur),
**Associate Professors**

Bandyopadhyay, Partha **Ph.D. (IIT Kharagpur)**, Thermally Sprayed coatings, Laser processing of materials

Bhattacharyya, Kingshook **Ph.D. (IIT Kharagpur)**, Dynamics

Biswas, Kajal **Ph.D. (IIT Kharagpur)**, Fluid Mechanics and Heat Transfer

Chakraborty, Goutam **Ph.D. (IIT Kanpur)**, Applied Mechanics

Das, Manab Kumar **Ph.D. (IIT Kharagpur)**, Robotics, Control Systems, Computer and Telecommunication Networks

Gupta, Sanjay **Ph.D. (Delft)**, Biomechanics, Finite Element Analysis, Machine Design

Kumar, Cheruvu Siva **Ph.D. (IIT Kharagpur)**, Manufacturing Process Modelling and Simulation

Moulic, Sandipan Ghosh **Ph.D. (Arizona)**, Theoretical and computational fluid dynamics and heat transfer, Hydrodynamic and thermal instability, Spectral methods in fluid dynamics, Non-Newtonian fluid dynamics

Pal, Surjya Kanta **Ph.D (IIT Kharagpur)**, Manufacturing Process Modelling and Simulation

Ramgopal, Maddali **Ph.D. (IIT Madras)**, Refrigeration & air conditioning, Carbon dioxide based natural circulation loops, Solid sorption systems

Ray, Kumar **Ph.D. (IIT Kharagpur)**

Roy Chowdhury, Asimava **Ph.D. (IIT Kharagpur)**, cutter design and manufacture for CTC machine (tea leaf cutting), Rapid prototyping with curved layers - CLFDM (Curved layer fused deposition modeling), CNC machining of free form (curved) surfaces, Direct slicing (without tessellation) for Rapid prototyping

Saha, Partha **Ph.D. (IIT Kharagpur)**, Laser processing of materials, Micro manufacturing, Nonconventional manufacturing, Rapid prototyping

Samantaray, Arun Kumar **Ph.D (IIT Kharagpur)**, Systems and Control, Vehicle system dynamics, Rotor dynamics, Nonlinear Mechanics

**Assistant Professors**


Gupta, Abhishek **Ph.D. (RICE Univ.)**, Robotics, Mechatronics, Haptics

Kalelkar, Chirag Deepak **Ph.D. (IISc., Bangalore)**, Rheology, Fluid Dynamics

Panda, Sushanta Kumar **Ph.D. (IIT, Delhi)**, Sheet metal forming, Hydroforming, Bulk forming, Formability test design and development, Theory of plasticity for metal forming, Laser and resistance spot welding of sheet metal

Paul, Jinu **Ph.D. (Nanyang Tech. Univ., Singapore)**, Polymer Nanocomposites, Joining of Materials

Racherla, Vikranth **Ph.D. (Univ. of Pennsylvania)**, Failure mechanics, Composite mechanics, Metal plasticity, Numerical modeling of thermo-mechanical processes

Ramanujam, S **Ph.D. (IIT Kharagpur)**, IC Engines

Sarangi, Mihir **Ph.D. (IIT Kharagpur)**

Sidpara, Ajay Muljibhai **Ph.D. (IIT Kanpur)**
**Faculty Appointments**

Jinu Paul  
Assistant Professor

Chirag Deepak Kalelkar  
Assistant Professor

**Faculty Resignation**

Anindya Chatterjee  
Professor

Ajeet Kumar  
Visiting Professor

**Brief Description of on-going activities**


**Thrust Areas**

1. High Speed Machining, Grinding and Development of Cutting Tools / Grinding Wheel
2. Micro Manufacturing and Microscale Transport Processes
4. System Dynamics, modelling and control
5. Vibration condition monitoring

**New Acquisitions**

1. Dell precision T7600 workstation
2. Precision spectral pyrometer
3. Twin hopper powder feeder
4. Micro vicker indenter for Leco LM 700 micro-hardness tester
5. Vacuum tube furnace
6. Torsion testing machine
7. B&K 2250-L-D30 Hand held analyzer 2250 light with 1/3 octase frequency analyser software
8. Cosmos make surface grinding machine
9. Micromatic make precision external cylindrical grinding machine
10. Die sinking electro-discharge machine
11. Chamber furnace with temperature controller and control panel
12. Contact angle meter
13. All geared universal milling machine
14. CNC flame cutting machine nesting software
15. Single axis stepper motor ball screw driven close loop controlled table with encoder
16. Indus make portable gas analyser
17. Electra CNC wire cut electro-discharge machine
18. 4-ch input module LAN-XI 51.2kHz
19. Cosmos high precision NC surface grinding machine
20. All geared lathe machine
21. Otis passenger elevator
22. Server mounted rack
23. SIMPACK Perpetual academic license multibody dynamics simulation tool
24. Sulzer metco power supply unit 10MR-04
25. Sulzer metco complete 9mc plasma control unit
26. Complete 9mcd plasma distribution unit
27. 2T friction stir welding unit
28. Trnsys software package
29. Gear hobbing machine
30. One time up-gradation of existing MSC ADAMS university 50 user license
31. Computer-controlled open-circuit subsonic wind tunnel with accessories
32. Rotary type torque sensor (Model 1702-20)
33. Product code VL-EDU.01-1-FY LMS virtual lab educational bundle LMS virtual lab software
34. Maple software and mapple sim
35. Magic RP SG module EOSTYLEE2
36. Motion simulation system
37. Computerized engine test set up for four cylinder four stroke MPF1 petrol engine
38. Nx8.5 academic CAD/CAM/CAE bundle perpetual license with one year ME&S
39. In-vehicle human vibration analyzer
40. CATIA V6 academic pack
41. Object 3D printer desktop series object30 scholar
42. Water Jet System
43. Multi channel - signal conditioner for rotating dynamo-meter

International Collaborations

Student exchange program with University of South California (USA). Student exchange program with University of Erlangen (Germany). Indo-South African Research Collaboration between IIT Kharagpur and Univ. Pretoria (SA). Research collaboration with Universite des Sciences et Technologies de Lille (France). UK-India Education and Research Initiative (UKIERI) Project in collaboration with Univ. Southampton (UK). Research collaboration with Växjö University, Sweden. Indo-US Project/ DST-NSF Project with UIUC and UCI (USA). DST-JSPS Project with University of Tokyo and Tokai University (Japan)

Lectures by Visiting Experts

1. Influence of thermal buoyancy on vortex shedding behind bluff obstacles by Dr. Dipankar Chatterjee (Simulation & Modeling Laboratory, CSIR-CMERI, Durgapur)
2. Soft Wetting at MicroNanoscales by Dr. Siddhartha Das (Micro and Nanoscale Transport Laboratory, Department of Mechanical Engineering, University of Alberta)
3. Micro and Nano-scale Transport Processes with Applications in Science and Engineering by Prof. Sushanta Mitra (University of Alberta, Canada)
4. Nano-Devices for Enhanced Thermal Energy Storage, Cooling and Sensing by Prof. Debjyoti Banerjee (Texas A&M University)
5. Micro-Extension Rheometer with Feedback Control for Microscale Samples by Dr. Chirag Kalekar (I.I.T. Mandi)
6. Development of a Large Scale Biorefinery for Production of Fuels and Chemicals by Dr. Amit Kumar (University of Alberta in Edmonton, Alberta, Canada)
7. Molecular mechanism of membrane targeting by GRP1 PH domain by Dr. Anand Srivastava (Department of Chemistry, Institute for Biophysical Dynamics and Computation Institute, University of Chicago)
8. Finite crystal elasticity of nanorods and nanotubes by Dr. Ajeet Kumar (Department of Mechanical Engineering, IIT Kharagpur)
9. Keynote Address (Research Scholars day) by Dr. Sumanta Neogi (Jadavpur University)
10. Patient-specific modelling of flow, heat transfer and endothelial dysfunction of a carotid artery by Prof. P. Nithiarasu (College of Engineering, Swansea University, U.K.)
11. High-Fidelity, Time-Efficient Modeling of Flexible Multibody Dynamics by Dr. Arun Banerjee (Former Principal Research Scientist, Lockheed Martin Advanced Technology Center, Palo Alto, CA, USA)
12. Eulerian and Lagrangian investigations of simple turbulent flows by Dr. Sathyanarayana Ayyalosomayajula (School of Mechanical Sciences, I.I.T. Bhubaneshwar)
Doctoral and MS Degrees Awarded

3. Amrita Priyadarshini : Finite Element Modeling of Chip Formation During Orthogonal Machining(Ph.D.)
4. Ajay Kumar Yadav : Numerical and Experimental Studies on Subcritical/Supercritical Carbon Dioxide Based Natural Circulation(Ph.D.)

Member - Professional Bodies

1. Ray, Manas Chandra, Life Member - ISTAM
2. Ramgopal, Maddali, Member (MIE) - Institute of Engineers (IE) India
3. Saha, Partha, Life Member - Indian Laser Association
4. Chakraborty, Suman, Member - APS
5. Chakraborty, Suman, Member - ASME
6. Chakraborty, Suman, Life Member - ISHMT
7. Pratihar, Dilip Kumar, Member - Association for Machines and Mechanisms
8. Pratihar, Dilip Kumar, Member - IEEE
9. Pal, Surjya Kanta, Life member - Indian Institute of Metals
10. Gupta, Sanjay, Member - European Society of Biomechanics
11. Sarangi, Mihir, Regular - Society for Experimental Mechanics, Inc., USA
12. Nath, Ashish Kumar, Life member - Indian Laser Association
13. Deb, Sankha, Member - American Society of Mechanical Engineers(ASME)
14. Das, Prasanta Kumar, Life member - Indian Society of heat and mass transfer
15. Kumar, Cheruvu Siva, Member - American Society of Mechanical Engineers
16. Kumar, Cheruvu Siva, Member - Institution of Electrical and Electronic Engineers
17. Kumar, Cheruvu Siva, Member - Association of Unmanned Vehicle Systems International (AUVSI)
18. Mohanty, Amiya Ranjan, - Member, National Committee on Noise Pollution Control, CPCB, Government of India
19. Mohanty, Amiya Ranjan, - Member, Bureau of Indian Standards on National Building Code, Government of India

Member - Editorial Board

2. Pratihar, Dilip Kumar (2012) Member of Editorial Board - Advances in Robotics Research, an International Journal
4. Pratihar, Dilip Kumar (2013) Member of Editorial Board - International Journal of Information Engineering
5. Pratihar, Dilip Kumar (2013) Member of the Editorial Board - International Journal of Mechanic Systems Engineering
6. Pratihar, Dilip Kumar (2012) Member of Editorial Board - International Journal of Applied Intelligence
7. Pratihar, Dilip Kumar (2013) Member of Editorial Board - Statistics, Optimization and Information Computing

Awards & Honours

Sponsored Research Projects

1. 2D Laser Doppler Velocinetry and Phase Dopler Particle Analyser (MHRD - FIST, Rs.120.00 Lakhs)
2. Active structural-acoustic control of smart structure using 1-3 piezoelectric composite (DST, Rs.16.00 Lakhs)
3. Advanced Control and failure prognosis and diagnosis of industrial processes using data Fusion (DIT Govt. of India, Rs.0.00 Lakhs)
4. Advanced research in Mechanical Engineering System (DST FIST program) (DST, Rs.694.00 Lakhs)
5. Aerodynamic design of traction rolling stock with speed potentials of 250 KM/H upgradeable to 350 KM/H (Indian Railways, Rs.734.24 Lakhs)
6. Algae mediated bio-sequestration and storage of carbon dioxide from coal based flue gas and assessment of Algal biomass for animal feed application (WB - DST, Rs.28.00 Lakhs)
7. Biomechanical Assessment of Current and Novel Total Knee Replacement (UKIERI British Council, Rs.10.41 Lakhs)
8. Carbon dioxide based natural circulation loops (CSIR, Rs.13.50 Lakhs)
9. Creep and warping analysis of hot running loco wheels towards development of design guidelines against gauge widening (Indian Railways, Rs.49.79 Lakhs)
10. Deep drawing of laser welded advanced high strength steels (Department of Science and Technology, Rs.19.02 Lakhs)
11. Design and development of automobile for SAE Formula 1 international competition for students (SRIC, Rs.10.00 Lakhs)
12. Development and Characterization of Nano-fluid for Micro-thermal Heat Transfer Applications in Advanced Satellite (DCN) (, Rs.0.00 Lakhs)
13. DEVELOPMENT AND PERFORMANCE EVALUATION OF THERMALLY SPRAYED BALL MILLED DIAMOND-METAL COMPOSITE POWDER FOR BEARING SURFACE APPLICATION (DST, Rs.43.00 Lakhs)
14. Development and processing of polymer based nanocomposite materials (SRIC, IIT Kharagpur, Rs.0.00 Lakhs)
15. Development of a Schlieren imaging system to study natural convection of heated vertical plate (SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
16. Development of Cage for Mariculture through Numerical and Physical Modeling (Ministry of Earth Science, Government of India., Rs.45.00 Lakhs)
17. Development of Remote Laboratory for Computer Integrated Manufacturing System (MHRD, Rs.91.50 Lakhs)
18. Development of Robust Signal Processing Techniques for Detection of Underwater Impact and Burst Noise (UIB) (Ministry of Earth Sciences, Rs.60.00 Lakhs)
19. Development of Sound Proofing Composite Materials using Jute Products (SPC) (JMDC, Kolkata, Rs.32.26 Lakhs)
20. Development of the underwater water assisted laser cutting process and associated systems including a laser water micro-jet cutting system (BRNS-DAE, GOI, Rs.29.88 Lakhs)
21. Droplet based screening of Amyloid β-peptide aggregation (DBT, Rs.0.00 Lakhs)
22. Dynamics of Shrouded and Part-span Shrouded Blade Assembly with Floating Mass Damper (GTRE, DRDO, Bangalore, Rs.35.50 Lakhs)
23. Establishment of an advanced research facility for EB welding and process development related to programs of interest to DAE (BRNS, DAE, Mumbai, Rs.42.53 Lakhs)
24. Finite element analysis of weld location on formability of tailor welded blanks (SRIC, IIT Kharagpur, Rs.4.90 Lakhs)
25. GM-CRL on ECS (GM USA, Rs.0.00 Lakhs)
26. High Power laser workstation - 2 kW CW Fibre Laser with five axis CNC table (DST-FIST (SERC), Rs.200.00 Lakhs)
27. HVOF sprayed ultrahard nanocomposites (DST SERB, Rs.43.00 Lakhs)
28. Investigation of Interfacial Bonding in Thermally Sprayed Coatings using Glow Discharge Optical Emission Spectroscopy (GDOES) Depth Profiling (Swiss National Science Foundation, Rs.4.00 Lakhs)
29. Materials for Underwater Vehicles (Ministry of Earth Sciences, Rs.48.00 Lakhs)
30. Modular Engineering of Vascular Tissue: A Bottom-up Approach (DBT, Rs.0.00 Lakhs)
31. MVL (MHRD, Rs.200.00 Lakhs)
32. Nanoscale Processes for Clean Coal and Bioinspired Water and GHG Efficient Energy Technologies (DST / GITA, Rs.8.00 Lakhs)
33. National Mission Project on Education through ICT, Developing suitable pedagogical methods (Thermodynamics) (MHRD, Rs.0.00 Lakhs)
34. Numerical simulation of turbulent plane offset jet flow and conjugate heat transfer (Department of Science and Technology, Rs.9.60 Lakhs)
35. On the dynamics of artificial joints (SRIC, IIT Kharagpur, Rs.4.90 Lakhs)
36. Optimal design of human muscle like electro active polymer actuators (DST, Rs.8.14 Lakhs)
37. Optimal design of tough wear resistant nanostructured coatings (SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
38. Participation in AUVSI - student coordination (NIOT Chennai, Rs.11.00 Lakhs)
39. Pedagogy (Mechanics of materials) (MHRD, Rs.0.00 Lakhs)
40. Pre-clinical analysis of failure mechanisms and design optimization of acetabular prosthesis (DBT, New Delhi, Rs.23.38 Lakhs)
41. Real Time Virtual Labs (Ministry of Human Resources Development, Rs.743.00 Lakhs)
42. Realtime Virtual Lab on Automotive Systems (RTV-2) (MHRD, Rs.65.00 Lakhs)
43. Setting up a research and development centre for Damodar Valley Corporation at Kolkata (DVC, Kolkata, Rs.10600.00 Lakhs)
44. STANDARDIZATION OF PROCESS PARAMETERS IN WITHERING, MACERATION, ROLLING, FERMENTATION AND DRYING OF TEA (Tea Board, GOI, Rs.366.96 Lakhs)
45. Steel Technology Centre (Ministry of Steel & DST, Rs.2025.00 Lakhs)
46. Studies on process optimisation and visualisation of laser cladding process (Board for Research in Nuclear Sciences (BRNS), DAE, GOI., Rs.18.86 Lakhs)
47. Study of flow and thermal characteristics in the near field of two parallel plane jets. (COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, Rs.9.56 Lakhs)
48. Suspension and Bogie Technology for High Speed Train (RDSO, Rs.86.00 Lakhs)
49. Suspension and Bogies Technology for High Speed Trains (Center for Railway Research and RDSO, Rs.71.75 Lakhs)
50. Theoretical and Experimental Analysis of Evaporation in the Grooves of a Micro Heat Pipe (ISRO, Rs.0.00 Lakhs)
51. Thermomechanically processed high strength bainitic steel rails for Indian Railways (RD & SO, Ministry of Railways, Rs.199.65 Lakhs)
52. Transient Bolling and Counter Current Flow Phenomena during Direct in Bundle Emergency Coolant Injection (BARC, Rs.45.00 Lakhs)
53. Turbulent Flow Computation of Two-Dimensional Incompressible Viscous Flow through a Cascade (ARDB Aerodynamics Panel, Rs.12.61 Lakhs)
54. Underwater Acoustic Sensors for AUVs (Ministry of Earth Sciences, Rs.48.00 Lakhs)
55. Virtual Laboratory on Mechanical Systems and Signal Processing (VLS/16) (MHRD, Rs.54.00 Lakhs)
56. Virtual Laboratory on multiphase flow (MHRD, Rs.0.00 Lakhs)
57. Virtual Labs (Mechanisms) (MHRD, Rs.17.00 Lakhs)
58. Virtual Labs - Main Phase (Simulation) (MHRD - NMEICT, Rs.823.00 Lakhs)
59. Virtual Labs - Pilot Phase (MHRD - NMEICT, Rs.200.00 Lakhs)
60. VLS-4 (MHRD, Rs.58.00 Lakhs)
61. Wireless Internet (Vodafone Centre of Excellence in Telecommunications / Telecom Centre of Excellence, Rs.48.00 Lakhs)

**Consultancy Projects**

1. Application of finite element and other analytical methods for failure analyses of roller bearings (ABC Bearings Limited, Bharuch, Gujarat, Rs.8.00 Lakhs)
2. Characterization of Surface Roughness for Pressure-Driven and/or Electro-osmotic Liquid Flow in Microchannel (DELPHI, Rs.0.00 Lakhs)
3. Demonstration of and advice on finite element analyses of elastic-plastic structures (Usha Martin Limited, Kolkata, Rs.2.00 Lakhs)
4. Design of cooling system for Plant Growth Chamber (Scigenics Biotech Private Limited, Rs.1.25 Lakhs)
5. Design of silencers for blowers (DDSBB) (M/s. Everest Blowers Pvt. Ltd. Haryana, Rs.4.50 Lakhs)
6. Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning (Pedagogy) (MHRD, Rs.0.00 Lakhs)
7. Development of a fundamental model for characterizing solidification transport in the mushy region (General Motors, Rs.0.00 Lakhs)
8. Development of a Multiphase Flowmeter (General Electric, India, Rs.3.00 Lakhs)
9. Development of Numerical Models for Emulsion and Nanofluid Heat Transfer (TATA Steel, Rs.0.00 Lakhs)
10. Development of System for monitoring of slow speed running equipment (SAIL, RDCIS, Ranchi - Completed, Rs.8.50 Lakhs)
11. Experimental sample preparation by Wire Cut EDM (Various institutes, Rs.0.75 Lakhs)
12. Finite Element Analysis of Stress Distribution in Electrode and Nipple Joint (HEG Bhopal, Rs.4.40 Lakhs)
13. Laser Processing of Materials (LAPM) (Various Departments / Centres of IIT Kharagpur and Outside Institutions, Rs.0.00 Lakhs)
14. Modelling and Simulation of Hydro-pneumatic Shock Isolation System, through Bond Graph on SOMBOLS Shakti (DRDO, R&D(E) Engineers, Through High Tech Consultance, STEP IIT Kharagpur, Rs.15.00 Lakhs)
15. Pulling force estimation on a ribbed bar (Tata Steel, Rs.5.50 Lakhs)
16. Refrigerator Noise Control Implementation (RNCI) (Whirlpool of India Ltd., Pune, Rs.17.00 Lakhs)
17. RTD Analysis of Mexican Tundish (IFGL REfractory, Rs.1.50 Lakhs)
18. RTD and Temp study of JSPL Jajpur tundish, (IFGL Refractory, Rs.1.50 Lakhs)
19. Simulation studies of P15A with modified hanger top (Mazagon Dock Ltd, Rs.28.09 Lakhs)
20. Support and training on trommel design (Tega Industries Limited, Kolkata, Rs.2.50 Lakhs)
21. Training on rolling mill simulation (Tata Steel, Rs.1.00 Lakhs)
22. Vetting of analysis and design of a vibration isolation system (VAVS) (Airef Engineers (P) Ltd., Delhi, Rs.2.00 Lakhs)
23. Wear analysis in laying head pipe (TISCO Jamshedpur, Rs.2.50 Lakhs)

**Patents (filed / granted)**

1. A force transducer for microscale samples
2. A method of maintaining the zone temperature in a variable air volume air conditioning system and a system thereof
3. A Novel 6DOF Platform for Micromanipulation with Piezoelectric Actuators and Compliant Mechanisms
4. A PROCESS OF CONFIGURATING MICROSIZED CHANNELS HAVING IMPROVED INCLINATION AND FOR ENHANCEMENT OF BOILING HEAT TRANSFER OVER PLANE SURFACE
5. An electromagnetic device for fault detection in rotating machines
6. An Energy and QoS Aware Method for Vertical Handover among Heterogeneous Wireless Networks
7. Cost effective mechanical testing equipment for characterizing creep behavior of materials under combined tension-torsion loadings

**Visits Abroad by Faculty Members**

1. Chakraborty, Suman - Collaborative Research (Technische Universität Darmstadt, ) May, 2012
2. Samantaray, Arun Kumar - Indo-Korean Joint Project (Daegu, South Korea, ) 17-25 June, 2012
3. Chakraborty, Suman - Collaborative Research (University of Southampton, UK, ) Nov, 2012
4. Bandyopadhyay, Partha Pratim - SNF -International Visiting Fellowship (University of Bern, ) 15th May - 12th July 2012
5. Gupta, Sanjay - 18th Congress of the European Society of Biomechanics (Lisbon, Portugal, ) July 4 - 8, 2012
Invited Lectures by Faculty Members

1. Automation for Integrated Manufacturing by Deb, Sankha (Department of Mechanical Engineering, Budge Budge Institute of Technology, Kolkata)
2. Introduction to computational fluid dynamics (CFD) by Moulic, Sandipan Ghosh (B.I.E.T. Suri)
3. Vibration assisted micro-manipulation by Das Gupta, Anirvan (IIT Delhi)
4. Vibration assisted transport and manipulation by Das Gupta, Anirvan (CMERI Durgapur)
5. Mechanics of biped walking and jumping by Das Gupta, Anirvan (Thapar University)
6. Vehicle Dynamics Modelling and Simulation by Samantaray, Arun Kumar (KIIT University, Bhubaneswar)
7. Bond Graph Modelling of Mechatronic Systems by Samantaray, Arun Kumar (Keimyung University Sin-Dang-Dong, Daegu, South Korea)
8. Introduction to Bond Graph Modelling by Samantaray, Arun Kumar (Catholic University of Daegu Hayang, Gyeongsan, South Korea)
10. Stress adaptation of a cell in a confined fluidic environment by Chakraborty, Suman (1st Indo-UK Workshop on Biomicrofluidics and Microscale Bioengineering, Southampton, UK)
13. Future of Mechanical Engineering: Mechanical Engineering at 2050 by Chakraborty, Suman (Occasion of the inauguration of ASME Chapter of ISM Dhanbad)
14. Effect of a Microconfined Fluidic Environment: Droplets/Cells, and Beyond… by Chakraborty, Suman (Indo-US Workshop on Fabronics, IIT Kanpur)
15. Effect of a Microconfined Fluidic Environment: Droplets/Cells, and Beyond… by Chakraborty, Suman (Fourth Workshop on Nanocomputing and Biochips)
16. Effect of a Microconfined Fluidic Environment: Droplets/Cells, and Beyond… by Chakraborty, Suman (First International Symposium on Physics and Technology of Sensors, CMET Pune)
17. Effect of a Microconfined Fluidic Environment: Droplets/Cells, and Beyond… by Chakraborty, Suman (39th National Conference on Fluid Mechanics and Fluid Power, Surat)
18. Biomicrofluidics: A Journey with DNAs, Cells, and Painless Microneedles by Chakraborty, Suman (National Workshop on CFD and it’s application in Bio-Fluid Dynamics (NWCBFD’12), Kolaghat)
20. Microfluidics on a Compact Disk by Chakraborty, Suman (4th Bangalore Nano, Bangalore)
21. Microfluidics on a Compact Disk by Chakraborty, Suman (Sixth ISSS International Conference on Smart Materials, Structures and Systems, Bangalore)
22. Prof. S K Sorhkel Memorial Lecture in Production Engg. Dept. Jadavpur University, Kolkata by Nath, Ashish Kumar (Jadavpur University)

Books Published


Papers Published in Journals


72. Nonlinear amplification in electrokinetic pumping in nanochannels in the presence of hydrophobic interactions By Suman Chakraborty, Dipankar Chatterjee, Chiroteep Bakli Physical Review Letters (accepted for publication) (2013)
82. Relaxation characteristics of a compliant microfluidic channel under electroosmotic flow By U. Mukherjee, J. Chakraborty, S. Chakraborty Soft Matter 9, 1562-1569 (2013)
89. Spatially uniform microflows induced by thermoviscous expansion along a traveling temperature wave: Analogies with electro-osmotic transport By D. Pal, S. Chakraborty *Physical Review E* 86, 016321 (2012)

**Papers Presented in Conferences**


10. Geodesic flows around rotating black holes, By DasGupta A., Nandan H., Kar S., 27th Meeting of the IAGRG, Srinagar (Garhwal), (2013)


Department of Metallurgical & Materials Engineering

**Head**
Prof. Siddhartha Das

**Professors**

Chakraborti, Nirupam  
*Ph.D. (Univ. of Washington, USA)*, Computational Materials Science  
Genetic Algorithms Extractive Metallurgy

Chakraborty, Madhusudan  
*Ph.D. (IIT Kharagpur)*

Das, Karabi  

Das, Siddhartha  

Dutta Majumdar, Jyotsna  

Godkhindi, Mahadev Malhar  
*Ph.D. (IIT Bombay)*, powder metallurgy Ceramics

Manna, Indranil  
*Ph.D. (IIT Kharagpur)*

Mitra, Rahul  
*Ph.D. (Northwestern Univ., USA)*, Mechanical Behaviour of Materials, Scanning and transmission electron microscopy, Materials for high temperature applications, Composite Materials, Nanocrystalline materials, Thin Film Processing and Characterization, Oxidation behavior of materials

Pabi, Shyamal Kumar  
*Ph.D. (IIT Kharagpur)*, Nanostructured materials Phase transformations Composites Modelling and simulation

Ray, Kalyan Kumar  

Roy, Gour Gopal  

Roy, Sanat Kumar  

Singh, Shiv Brat  
*Ph.D. (Cambridge Univ, UK)*, Physical metallurgy of steel

**Associate Professors**

Acharya, Narendra Nath  
*Ph.D. (IIT Kharagpur)*, Artificial Intelligence, Powder Metallurgical Applications, Multi-Media, Educational Technology, Photography

Ghosh, Sudipto  

Sant, Sudhindra B  
*Ph.D. (Queen's Univ., Canada)*, Thin Film Electronic Materials and Nanostructures, Spintronic Thin Films, Defects in Thin Film Semiconductors, Wide band-Gap Semiconductors, MEMS devices, Photovoltaic Thin Films, Biomaterials and Biomimetics, Nanomaterials and Nanocrystalline Plasticity
Assistant Professors

Aich, Shampa  
Ph.D. (Univ. of Nebraska, USA), Rapid Solidification, Magnetic Materials, Shape Memory Alloys, Surface Modifications, Biomaterials

Bhaduri, Amit  
M.Tech. (IIT Kanpur), STRUCTURE-PROPERTY RELATIONSHIP

Biswa, Koushik  
Ph.D. (Univ. of Stuttgart, Germany), Energy materials (Hydrogen storage Solid Oxide Fuel Cell Lithium Ion Battery, Abinitio and MD Modeling, Electroceramics, Structural Ceramics, Ceramic Reinforced Metal Matrix Composites, Sintering (Microwave SPS Conventional)

Chakrabarti, D  
Ph.D. (Univ. of Birmingham, UK), Microstructure property correlation in metals, Development of microstructure and texture in thermo-mechanical processing, Fracture toughness and fracture transition behaviour in metals, Development and effect of mixed grain structures in metals, Segregation during solidification and its effect on properties, Modelling based on dislocation theory, Defect initiation and its control in metals

Das, Jayanta  
Ph.D. (TU Dresden, Germany), Solidification and Non-equilibrium Processing, Metastable and Nanostructured Alloys, High Temperature Oxidation, Structure-Property Relationship, Phase Transformation

Kar, Sujoy Kumar  
Ph.D. (The Ohio State Univ.), Physical and Mechanical Metallurgy, Processing-Microstructure-Microtexture-Property Relationship, Materials and property modeling, Materials systems: Ti alloys and Ni based superalloys and steels for power plant applications

Kundu, Tarun Kumar  
Ph.D. (Lulea Univ of Tech, Sweden), Atomistic Simulations of Materials, Extractive Metallurgy, Computational Fluid Dynamics, Mineral processing

Laha, Tapas  
Ph. D. (Florida Int. Univ., Miami), Nanocomposites - Processing & Characterization, Interfacial Phenomena, Surface Engineering & Coating

Chair Professor

Ghosh, R.N.  
Ph.D. (IIT Kharagpur)  
Physical Metallurgy

Chair Professor

Sen, P.K.  
Ph.D. (Jadavpur University)  
Process Metallurgy

Brief Description of on-going activities

The Research and Development Program of the Department encompasses various areas like Corrosion Science and Technology, Extractive Metallurgy, Mechanical Metallurgy, Melting, Casting and Solidification Processing, Modeling, Simulation and Multimedia in Metallurgical Engineering, Physical Metallurgy, Powder Metallurgy, Surface Engineering etc. In the field of Extractive Metallurgy significant contributions for metal value extraction, particularly Cu, Ni and Co from sea nodules has been made. Direct reduction of iron ore using mine generated ore and coal fines is another major research area. Other areas of interests include the mathematical modeling of fluid flow and heat transfer during welding. In the domain of Mechanical Metallurgy, a pioneering achievement has been the design and development of fatigue testing using rotating bending machine to study short, long and non-propagating crack behaviour in several steels. Investigations related to structure-property relationship of various ceramic and metal-matrix composites, high temperature materials and advanced alloys are thrust areas of activity. Development of newer grades of dual phase and micro alloyed steels through fracture based studies, correlation between fracture and wear characteristics of materials, development of thin sheet steel components are some important fronts in this direction. In addition, research is progressing in the area of mechanical behaviour of small volume materials. The major areas in the field of Melting, Casting and Solidification Processing include: development of cast micro-alloyed steels, studies on the hot tearing of long freezing range Al alloys, austempered ductile
iron through non-conventional route, grain refinement of Al alloys and the development of cast metal matrix composites. Success has been achieved in improving the mechanical properties of some hypoeutectic and eutectic Al-Si alloys by combined grain refinement and modification treatment using indigenously developed Al-B and B rich Al-Ti-B master alloys and Sr, respectively. In addition to mathematical modeling works in the areas of surface engineering, phase transformation, solidification processing, facture & fatigue, some more new areas have surfaced and these are: application of genetic algorithm for the optimization of metallurgical systems, mathematical simulation of high temperature metallurgical systems by application of computational fluid dynamics, heat and mass transfer, molecular dynamic simulation of nanostructured materials etc. Several Al-Cu-TM and Al-TM-Si (TM = transition metal) Al-Ni-Ti ternary alloys, and Al-alloys containing rare earth metals have been synthesized and characterized to explore the possibility of developing bulk amorphous Al-alloy by mechanical alloying and identifying the criteria of selection of such amorphous alloy compositions. The present activities of the Powder Metallurgy group include synthesis of particulate reinforced mullite and their property evaluation, production of Al2O3 reinforced Ni3Al thorough reaction sintering route, reaction sintering of silicon carbide, recovery of copper from printed circuit etchant sludge and production of silicon carbide from fly ash silica. Research has been initiated in the area of semi-solid processing for casting and forming operations of Al-alloy matrix composites. In addition, significant progress has been achieved in the synthesis of Fe-TiC, Fe-ZrC and Fe-TiB2 composites from cheaper raw materials by aluminothermic reduction method. Among several activities related to surface engineering, laser assisted surface modification, ion implantation and plasma spray deposition are the primary areas of active research interest. The research activities in the area of Environmental Degradation embraces fundamental studies relating to film/scale growth processes on different metal-oxygen and metal-halogen systems with emphasis on kinetics and growth mechanisms, defect structures of compounds, transport properties of different species, adhesion and protective properties of the scales etc. Studies on high temperature oxidation behaviour of multi-phase refractory metal-silicides like Molybdenum and Niobium Silicides are in progress. In the area of aqueous corrosion, the current activities are concentrated on the studies relating to corrosion behaviour of amorphous and nanocrystalline Zr-based binary alloys, corrosion and stress corrosion performance of aluminum based composites and Al-Ni alloys and stress corrosion cracking of nickel alloys in hydrogen fluoride environment. Development of Lithium Ion Battery (LIB) Technology for applications in Electric Vehicles in India has taken the role of a prominent research area in the Department.

**Thrust Areas**

1. **CLASSICAL METALLURGY AND MATERIALS SCIENCE**
   i. Extractive metallurgy; ii. Solidification and nonequilibrium processing; iii. Metastable alloys and Phase transformation; iv. Deformation and fracture behavior; v. Joining of metals; vi. Corrosion behavior and high temperature oxidation; vii. Powder Metallurgy
2. **COMPUTATIONAL MATERIAL SCIENCE**
   i. Modeling and simulation in process metallurgy; ii. Modeling of phase transformation kinetics; iii. Molecular dynamics; iv. Design & scale-up of metallurgical processes; v. Modeling and simulation of iron making processes
3. **IRON AND STEEL**
   i. Raw material processing and mineral beneficiation; ii. Advanced autograde steel; iii. Improvement in mechanical properties like creep, fatigue, fracture and non-destructive testing
4. **ADVANCED MATERIALS**
   i. Composites & functionally graded materials; ii. Nanomaterials and nanocomposites; iii. Surface engineering & Interfacial phenomena; iv. Thin film coatings; v. Biomaterials; vi. Lithium ion battery; vii. Solid oxide fuel cells (SOFCs)

**New Acquisitions**

1. Thermal Conductivity Analyzer
2. Slurry Erosion Test Set Up
3. Impact Wear Testing Set Up
4. Ultra Pure Water Purification System
5. Fretting Wear Test Set-up
Lectures by Visiting Experts

1. Exploring coherent transport in complex oxides by Dr. Jaykanth Ravichandran (Research Associate, Columbia University, New York, USA)
2. Assessment and application of equilibrium slag – metal phosphorus partition for basic oxygen steelmaking by Prof Ahindra Ghosh (Retired Professor, Department of Materials and Metallurgical Engineering, Indian Institute of Technology Kanpur)
3. Modeling and Simulation Related to the Manufacturing of Aircraft Engine Components by Dr. Shesh Srivatsa (Consultant, GE, Aviation, USA)
4. Polymer-Derived Porous Ceramics for Energy and Environmental Applications by Dr. Ravi Mohan Prasad (Technische Universität Darmstadt,Fachbereich Material-und Geowissenschaften, Petersenstrasse 32, 64287 Darmstadt, Germany)
5. Inclusions and their control in steel by Prof Ahindra Ghosh (Retired Professor, Department of Materials and Metallurgical Engineering, Indian Institute of Technology Kanpur)

Doctoral and MS Degrees Awarded

1. S. Patra : Development of ultafine grained HSLA steel with mixed grain structure(MS)
2. A. Chatterjee : Thermal fatigue behaviour of Cu-Cr-Zr alloys(MS)
3. S. Sahoo : Mathematical modeling of twin-roll strip casting of Al-3.3Cu and its experimental validation(PhD)
4. A. Karmakar : Rapid transformation annealing treatment for development mixed microstructures in low-carbon steels(MS)
5. K. Dutta : Accumulation of ratcheting strain in polycrystalline metallic materials(PhD)
6. Ashutosh : Development of ceria reinforced lead free tin based nanocomposites by pulse co-electrodeposition technique(PhD)
7. J. Das : Microstructure, mechanical properties and oxidation behaviour of some tungsten alloys(PhD)
8. N. Yedla : Deformation behavior of ribbons of Copper-Zirconium based metallic glass with nanocrystalline precipitates-Classical molecular dynamics and experimental studies(PhD)
9. S. Acharya : Mechanical behaviour of spot welds on interstitial free steel sheets(MS)
10. S. Chakraborty : Effect of annealing on texture evolution and oxide formation in nanocrystalline nickel-iron alloys(PhD)

Member - Professional Bodies

1. Dutta Majumdar, Jyotsna, Life Member - National Academy of Science, Allahabad
2. Mitra, Rahul, Member - The Minerals, Metals and Materials Society
3. Mitra, Rahul, Member - Programme Advisory Committee on Minerals, Metals and Materials, Department of Science and Technology
4. Mitra, Rahul, Member - American Society of Materials
5. Mitra, Rahul, Member - American Institute of Steel Technology
6. Mitra, Rahul, Life Member - Indian Institute of Metals
7. Mitra, Rahul, Life Member - Indian Ceramic Society
8. Mitra, Rahul, Life Member - Materials Research Society of India
9. Kundu, Tarun Kumar, regular - Indian Institute of Metal
10. Kundu, Tarun Kumar, Member - The Minerals, Metals & Materials Society
11. Biswas, Koushik, Life Member - Materials Research Society of India (MRSI)
12. Biswas, Koushik, Life Member - The Indian Ceramic Society
13. Biswas, Koushik, Life Member - The India Science Congress Association
14. Biswas, Koushik, Member - The Mineral Metal and Material Society, USA
15. Biswas, Koushik, Life Member - The Indian Institute of Metals
16. Aich, Shampa, Life Member - Indian Institute of Metals
17. Aich, Shampa, Regular - Institute of Biological Engineers (IBE)
18. Aich, Shampa, Regular - Materials Research Society (MRS), USA
19. Aich, Shampa, Regular - The Minerals, Metals & Materials Society (TMS), USA
20. Sant, Sudhindra B, Member - Materials Research Society
21. Chakrabarti, D, Life Member - Indian Institute of Metals
22. Chakrabarti, D, Member - Institute of Minerals, Materials and Mining (IOM3)
23. Laha, Tapas, Professional Membership - The Materials Research Society (MRS)
25. Laha, Tapas, Life Membership - The Indian Institute of Metals (IIM)
26. Laha, Tapas, Life Membership - The Indian Science Congress Association (ISCA)
27. Kar, Sujoy Kumar, Member - Indian Institute of Metals
28. Kar, Sujoy Kumar, Member - ASM International
29. Kar, Sujoy Kumar, Committee member of two different technical groups of - The Minerals, Metals & Materials Society (TMS)
30. Kar, Sujoy Kumar, Member - Alpha Sigma Mu (the International Professional Honour Society for Materials Science & Engineering)
31. Das, Jayanta, Member - NACE International
32. Das, Jayanta, Member - Deutsche Gesellschaft fur Materialkunde e.V. (German Society for Materials Research)
33. Das, Jayanta, Life Member - The Indian Institute of Metals
34. Roy, Sanat Kumar, Life Member - Materials Research Society of India
35. Roy, Sanat Kumar, Life Member - The Indian Institute of Mineral Engineers
36. Roy, Sanat Kumar, Regular Member - The Mining, Geological and Metallurgical Institute of India
37. Roy, Sanat Kumar, Regular Member - Corrosion Society of India
38. Pabi, Shyamal Kumar, Life member - Indian Institute of Metals
39. Pabi, Shyamal Kumar, Life member - Materials Research Society of India
40. Pabi, Shyamal Kumar, Member and former Sectional President of Metal Science Section - Indian Science Congress Association
41. Chakraborty, Madhusudan, Life Member - Materials Research Society of India
42. Chakraborty, Madhusudan, Member - Institute of Indian Foundrymen
43. Chakraborty, Madhusudan, Life Member - Indian Institute of Metals
44. Ray, Kalyan Kumar, Fellow - Indian Institute of Metals
45. Ray, Kalyan Kumar, Life member - Indian group of International Stereological Society
46. Ray, Kalyan Kumar, Life Member - Material Research Society of India
47. Ray, Kalyan Kumar, Life Member - Powder Metallurgical Association of India
48. Roy, Gour Gopal, Life Member - Indian Institute of Metals
49. Das, Siddhartha, Life Member - Tau Beta Pi, a national engineering honour society, USA
50. Das, Siddhartha, Life Member - Sigma Xi, a national scientific research society, USA
51. Das, Siddhartha, Life Member - Indian Institute of Metals
52. Das, Siddhartha, Life Member - Materials Research Society of India
53. Das, Siddhartha, Life Member - Powder Metallurgy Association of India
54. Das, Karabi, Life member - Indian Institute of Metals
55. Das, Karabi, Life member - Materials research society, India
56. Ghosh, R N, Life Member - Indian Society for Non Destructive Testing (ISNT)
57. Ghosh, R N, Life Member - Indian Institute of Welding
58. Ghosh, R N, Life Member - Indian Institute of Metals
59. Sen, Prodip Kumar, Life Member - Indian Institute of Metals

**Member - Editorial Board**

1. Chakraborti, Nirupam (0) Member Editorial Board - Materials & Manufacturing Processes
2. Chakraborti, Nirupam (0) Member Editorial Board - International Journal of Machining and Machinability of Materials
6. Dutta Majumdar, Jyotsna (2012) Member - Scientific Reports
11. Pabi, Shyamal Kumar (2012) Member - Advances in Materials Research (AMR)
15. Sen, Prodip Kumar (2012) *Member, Editorial Board* - Steel Tech

**Awards & Honours**

1. Dutta Majumdar, Jyotsna (2012) 2012 - *Metallurgist of the Year*
2. Chakraborti, Nirupam (2005) *Adjunct Professorship, POSTECH, Korea*
3. Dutta Majumdar, Jyotsna (2013) *MRSI Medal*

**Fellowships**

1. Dutta Majumdar, Jyotsna (2012) *DAAD-reinvitation fellowship*

**Sponsored Research Projects**

1. Atomistic Simulation of Gas Hydrates and Stabilizer/Inhibitor Design (MINISTRY OF EARTH SCIENCES, Rs.31.92 Lakhs)
2. Carbon Abatement In ironmaking Blast Furnace (Ministry of Steel, Rs.0.00 Lakhs)
3. Correlation between Processing, Microstructure, Microtexture & Property in a beta Titanium alloy Ti-5553 (IIT Kharagpur (ISIRD Project), Rs.5.00 Lakhs)
4. Development of Aluminium Cenosphere Syntactic Foam Through Spray Forming Technique for Aerospace Application (Aeronautics Research and Development Board (ARDB), N. Delhi, Rs.0.00 Lakhs)
5. Development of Compositionally and Microstructurally Graded Thermal Barrier Coating by Plasma Spraying (Department of Science and Technology, N. Delhi, Rs.39.55 Lakhs)
6. Development of ductile cast iron for spent fuel sub-assembly cask for PFBR (IGCAR, Kalpakkam, Rs.32.68 Lakhs)
7. Development of Expert System for Indian Blast furnace (Ministry of Steel, Rs.84.46 Lakhs)
8. Development of Functionally Graded Metallic Components by Laser Materials Processing for Bio-implant Application (Department of Science and Technology, India, Rs.9.70 Lakhs)
9. Development of high energy density lithium ion prismatic batteries for laptops, solar and electric vehicles (Future Hi-tech Batteries Ltd., Punjab, Rs.3.98 Lakhs)
10. Development of high strength ferrite-bainite steels (SAIL, Rs.6.72 Lakhs)
11. Development of High Strength to Weight Ratio Materials for the Body of Under Water Vehicle (National Institute of OCEan Technology, Rs.76.02 Lakhs)
12. Development of Molybdenum and Niobium silicide based alloys and composites for elevated temperature applications (Defence Research and Development Organization, Rs.32.41 Lakhs)
13. Development of pilot scale pelletisation technology (Ministry of Steel, Rs.89.42 Lakhs)
14. Effect of ferrite grain structure on the mechanical properties of low-carbon steel (CSIR, New Delhi, Rs.20.00 Lakhs)
15. Essar Steel Research Wing (Essar Steel Limited, Rs.25.00 Lakhs)
16. Establishment of an advanced research facility for EB welding and process development related to programs of interest to DAE (EBW) (BRNS, DAE, Mumbai, Rs.132.00 Lakhs)
17. Evaluation of Manganese Nodules (Ministry of Earth Sciences, Rs.0.00 Lakhs)
18. Feasibility of Sequestration of Carbon Di-Oxide from Industrial Systems (NIOT, Chennai, Rs.12.36 Lakhs)
20. High Strength TRIP-aided Steel for Automobiles (Tata Steel, Rs.11.68 Lakhs)
21. Innovative heat treatment of cast microalloyed steels for improving the properties. (Funded by: CSIR, New Delhi. (HTS), Rs.15.00 Lakhs)
22. Life estimation and microstructural damage of irradiated and unirradiated Cu-Cr-Zr alloy (NFP-BRFST, Ahmedabad, Rs.30.38 Lakhs)
23. Machinery Development in Tea Processing Industry (Tea Board, Rs.360.00 Lakhs)
24. Mathematical Model Development for Induration Cycle of Different Ore Sources (Ministry of Steel, GoI, Rs.89.42 Lakhs)
25. MD-Stochastic Model-based Design, Synthesis and Thermo-Physical Characterization of Nanofluids for Advanced Heat Transfer Applications (Naval Research Board, DRDO, Rs.48.40 Lakhs)
26. Microstructural Characterization and its Optimization for Improved Weld Strength, Fatigue Behavior and Corrosion Resistance of Electron Beam Welded Ma (Board of Research on Nuclear Science, Rs.22.00 Lakhs)
27. Microstructure-Texture-Toughness relations in High Strength Automotive Steel. (Funded by: DST, New Delhi. (HAS), Rs.28.00 Lakhs)
28. MICROWAVE ASSISTED SYNTHESIS OF NANOCRYSTALLINE ELECTRO-CERAMICS FOR FERRO-ELECTRIC RELAXORS AND SOFCs (CSIR, New Delhi, Rs.21.98 Lakhs)
29. Nanocrystalline Plasticity (DST, Rs.15.00 Lakhs)
30. NANOF uid BASED COOLANT AND COMBUSTION FUEL SYSTEM (Kalpana Chowla Space Technology Centre, Rs.17.00 Lakhs)
31. Optimization of design & operating parameters like wire speed, bath super heat, steel grades on calcium recovery and its efficacy (Ratriiya Ispat Nigam Limited, Rs.8.45 Lakhs)
32. Optimization of Processing Parameters to Produce High Aspect Ratio Synthetic Wollastonite (Indian Rare Earths Ltd., Kerala, Rs.38.32 Lakhs)
33. Physico-Chemical Analysis of Metal Based Ayurvedic Bhasma Drugs by Sophisticated Modern Instrumental Methods (DST, Rs.20.35 Lakhs)
34. Picometer displacements in piezoelectric thin film membranes for resonators (DST, Indo-Portuguese Joint Research project, Rs.3.70 Lakhs)
35. Process induced microstructural variation towards improved ductile-brittle transition temperature (DBTT) of 9Cr-1Mo steel (BRNS, Department of Atomic Energy (DAE), Rs.21.00 Lakhs)
36. Processing and characterization of bulk nanostructured brass (Department of Science and Technology, SERC, Rs.22.87 Lakhs)
37. Processing, characterization and deformation behavior of Ti-Fe-(Sn) ultrafine eutectic composites (ISIRD, SRIC, I.I.T. Kharagpur, Rs.5.00 Lakhs)
38. Silicon Carbide sensors as high temperature power electronic devices. (ISRO-KCSC, Rs.5.00 Lakhs)
39. Solvent Extarction using Ionic Liquids for High Value Metal (IIT, Rs.4.70 Lakhs)
40. Steel Technology Centre (Ministry of Steel and Department of Science and Technology, Rs.2025.86 Lakhs)
41. Structural Characterization of Materials Lab (MHRD, New Delhi, Rs.495.00 Lakhs)
42. Structure-property relations in ceramic composites for high temperature applications in nose cone tiles in hypersonic vehicles (Defence Research and Development Organization, Rs.72.96 Lakhs)
43. Studies on process optimisation and visualisation of laser cladding process (BRNS-DAE, Rs.18.00 Lakhs)
44. Study of correlation between Processing, Microstructure, Microtexture and Property in a high strength, beta Titanium alloy Ti-5Al-5Mo-5V-3Cr (DRDO, Rs.40.00 Lakhs)
45. Synthesis and properties of electrodeposited Nickel/Ceria nano composites (IREL, Rs.27.81 Lakhs)
46. Ti/TiB2 Bi-layered and Multi-layered Coating on Steel Substrate by Pulsed Laser Deposition (PLD) Technique to Improve Tribological Properties (CSIR, Rs.19.25 Lakhs)
47. Versatile nano Zirconia production at Indian Rare Earths Limited, OSCOM (IRELTDC, Indian Rare-earths, Limited, Kerala, Rs.52.36 Lakhs)

Consultancy Projects

1. Corrosion resistance test of Reinforcement of Existing Major Bridge on Kanchnalla and River Bhargavi (CREB) (M/s Bhubaneswar Expressway Pvt. Ltd., N. Delhi – 110001, Rs.0.00 Lakhs)
2. Structure property correlation in near eutectoid steels, (Tata Steel,., Rs.05.01 Lakhs)
3. Artificial Neural Network Modeling of Materials (GE India Technology Center Pvt. Ltd., Rs.2.50 Lakhs)
4. Charpy impact testing of TMT rebar (Tata Steel, Jamshedpur, Rs.10.00 Lakhs)
5. Consultancy project on extractive metallurgy of polymetallic nodules (Ministry of Earth Science, New Delhi, Rs. 40.53 Lakhs)
6. Creep modelling of high temperature alloys for super critical applications (CHAC) (BHEL R&D, Hyderabad, Rs. 8.00 Lakhs)
7. Development of high strength automotive steel by quenching and partitioning (Q&P) treatment (Tata Steel, Jamshedpur, Rs. 8.00 Lakhs)
8. Development in process design to achieve improved structural integrity of gun barrel (Metal & Steel Factory, Ishapore, Rs. 24.27 Lakhs)
9. Development of air cooled microalloyed steel with improved toughness for forging applications (Ashok Leyland, Rs. 12.00 Lakhs)
10. Examination of cold rolled stainless steel samples (Salem Steel Plant, Rs. 0.67 Lakhs)
11. Genetic Algorithms in Blast Furnace (Åbo Akademi University, Finland, Rs. 0.00 Lakhs)
12. Improvement of Adhesion between Bead Wire and Rubber Material inside Radial Tires (Tata Steel, Rs. 39.00 Lakhs)
13. Optimizing the properties of galvanized steel (TATA Steel, Rs. 0.00 Lakhs)
14. Process Optimization of Polymetallic Nodules (Consulting for Extractive Metallurgy) (Ministry of Earth Sciences, Rs. 0.00 Lakhs)
15. Quality improvement of silver medallion obtained from Kolkata mint (India Govt. Mint, Kolkata, Rs. 4.74 Lakhs)
16. SEM and TEM Examination of Cold Rolled Stainless steels (Salem Steel Plant, Tamil Nadu, Rs. 1.00 Lakhs)
17. Strength and fracture behaviour of spot-welds in automotive steel sheets (Tata Steel, Rs. 17.83 Lakhs)
18. Stress relaxation behavior of steel reinforcing strands (SRBS) (Tata Steel Limited, Rs. 11.00 Lakhs)
19. Study of structure-property relations of wire ropes for achieving improved service performance (Usha Martin Ltd., Rs. 19.05 Lakhs)
20. Testing of Tungsten Carbide Tips (Customs, Rs. 0.67 Lakhs)

**Patents (filed / granted)**

1. Oxide dispersion strengthened powder metallurgy ferritic alloy and process for producing the same.
2. Synthesis of Bulk nanocomposites by non contact cavitation method

**Visits Abroad by Faculty Members**

1. Kar, Sujoy Kumar - Research Collaboration (University of North Texas, Denton, USA, ) May 2012
2. Kar, Sujoy Kumar - Research Collaboration (The Ohio State University, Columbus, Ohio, USA, ) June 2012
4. Roy, Gour Gopal - To attend International Conference and present a paper (Zacopane, Poland, ) 13th January to 16th January, 2013
5. Dutta Majumdar, Jyotsna - As a visiting Scientist (Karlsruhe Institute of Technology, Karlsruhe, ) 2 months
6. Chakrabarti, D - Paper presentation in 4th International Conference on Thermomechanical Processing of Steels (Sheffield UK, ) 10-12 September, 2012

**Invited Lectures by Faculty Members**

1. Recovery & Efficacy of Cored Wire Injection in Steel Melt towards Clean Steel Production by Roy, Gour Gopal (Jadavpur University)
2. Some Studies on the Reduction Kinetics of Iron Ore-Carbon Composite Pellets in Rotary Hearth Furnace by Roy, Gour Gopal (Jadavpur University)
3. Cored Wire Injection in Steel melt by Roy, Gour Gopal (NML Jamshedpur)
4. The role of twins, nanocrystallinity and silver-oxygen complex species for biological efficacy of no by Sant, Sudhindra B (Department of Metallurgical Engineering, BHU, Varanasi)

5. Transmission Electron Microscopy of II-VI compound semiconductors by Sant, Sudhindra B (Department of Metallurgical Engineering, BHU, Varanasi)

6. Structure-Property Relations of Interfaces in Metal and Ceramic Matrix Composites by Mitra, Rahul (IIT-BHU)

7. Mechanical Properties of Ceramic Materials by Mitra, Rahul (IIsc, Bangalore)

8. Mechanical Properties of Ceramic Matrix Composites by Mitra, Rahul (IIsc Bangalore)

9. Effect of microstructure, non-metallic inclusions and texture on toughness of ferritic steel by Chakrabarti, D (Scientific Services Department, Tata Steel)

10. Comparison of data driven and analytical blast furnace models(KOMPLASTECH 2013) by Sen, Prodict Kumar (Poland, Zakopane,January 13th-16th)

11. Sustainable Development for Aluminium & Magnesium(EEINFI-2012) by Sen, Prodict Kumar (Kolkata,India,December 7th-8th)

12. Parameters influencing the Performance of Niobium Superconducting Cavities- Few Open Issues by Dutta Majumdar, Jyotsna (Inter University Accelerator Centre, N. Delhi)

13. Thermal Barrier Coating by Dutta Majumdar, Jyotsna (High Temperature Coating Division, DLR, Germany)

14. Microstructural Designing and Process Optimization in Laser Surface Engineering by Dutta Majumdar, Jyotsna (Institute of Lasertechnique, Aachen, Germany)

15. Multi-scale Microstructural Control in Laser Surface Engineering by Dutta Majumdar, Jyotsna (Ruhr University, Bochum, Germany)

16. Copper based Shape Memory Alloy by Dutta Majumdar, Jyotsna (University of Munster, Germany)

17. Characterization of materials using FESEM, HRTEM, AFM and XRD by Biswas, Koushik (Materials Science Centre, IIT Kharagpur)

18. Renewable Sources of Energy in India: Initiatives, Challenges and Future Perspectives by Biswas, Koushik (Kanpur, Orissa)

19. A few aspects on the processing and deformation of advanced eutectic alloys by Das, Jayanta (Fifth International Conference on Solidification Science and Processing (ICSSSP5), The Crown, Bhubaneswar, organized by IIT Bhubaneswar)

Papers Published in Journals

1. A few aspects on the processing and deformation behavior of advanced eutectic alloys By J. Das, Tapabrata Maity Transactions IIM 65, 571-576 (2012)


11. Cold-rolling and inter-critical annealing of low-carbon steel: Effect of initial microstructure and heating-rate  
   By A. Karmakar, M. Ghosh, D. Chakrabarti  

12. Densification and characterization of W-Cr-Nb alloys prepared by sintering of mechanically alloyed nanocrystalline powders  
   By S. Telu, R. Mitra and S.K. Pabi  

   By A. Karmakar, A. Karani, S. Patra, D. Chakrabarti  

14. DFT Analysis of Lithium De-intercalation in Li2FeVO4  
   By Shamik Chakrabarti, Awalendra K. Thakur, K. Biswas  
   Ionics  DOI 10.1007/s11581-0  (2013)

15. Dodecahedron Methane Hydrate Cage Structure – An Ab initio Study  
   By Snehanshu Pal and T. K. Kundu  

16. Effect of Age-Hardening on Dry Sliding wear behavior of mushy state rolled In-situ Al-4.5Cu-5TiB2 composites  
   By K. Pavitra and R. Mitra  
   Materials Science and Engineering A 557, 84-91  (2012)

17. Effect of hot rolling temperature and thermal cycling on creep and damage behavior of powder metallurgy processed Al-SiC particulate composite  
   By Jishnu J. Bhattacharyya and R. Mitra  
   Materials Science and Engineering A 557, 92-105  (2012)

18. Effect of laser post-treatment on Al2O3-TiB2-TiN composite coating with free hBN  
   By Chatterjee S., Dutta Majumdar J., Shariff S. M., Padmanabham G., Roy Choudhury A.  

19. Effect of Oxygen Partial Pressure on the Cyclic Oxidation Behavior of Mo76Si14B10  
   By BARNA ROY, KHUSHBOO,JAYANTA DAS, RAHUL MITRA, and SANAT KUMAR ROY  
   METALLURGICAL AND MATERIALS TRANSACTIONS A  DOI: 10.1007/s11661- (2013)

20. Effect of SiC content, additives and process parameters on densification and structure-property relations of pressureless sintered ZrB2-SiC composites  
   By Manab Mallik, Sabyasachi Roy, K.K. Ray and R. Mitra  
   Ceramics International 39(3), 2915-2932  (2013)

   By M. H. Lee, J. Das, D. J. Sordelet, J. Eckert, A. J. Hurd  

22. Evaluation of microstructure and mechanical properties of partially amorphous and nanocrystalline Al50Ti40Si10 composites prepared by mechanical alloying and hot isostatic pressing  
   Materials Science and Engineering A 555, 21-27  (2012)

23. Evaluation of microstructure and mechanical properties of nano-Y2O3 dispersed ferritic alloy synthesized by mechanical alloying and consolidated by high pressure sintering  
   Metallurgical Transaction A In press  (2013)

24. Evolution of texture and nature of grain growth on annealing nanocrystalline Ni and Ni-18.5%Fe in air  
   By S. Chakraborty, M. Settem and S. B. Sant  
   MaterialsXpress accepted  (2013)

25. Flow behaviour of a heat treated tungsten heavy alloy  

26. Green-synthesis and characterization of Silver Nanoparticles by aqueous Leaf extracts of Cardiospermum helicacabum L  
   By D.Vishnudas, B. Mitra, M. Sant and A. Annamalai  

27. High Temperature Oxidation Behavior of W-Cr-Nb Alloys in the Temperature Range of 800-1200 °C  
   By Suresh Telu, Rahul Mitra, Shyamal Kumar Pabi  

28. In-situ synthesis, microstructure and properties of TiC & (Ti,W)C-reinforced Fe-Mn-Al austenitic steel matrix composites  
   By A.K. Srivastava and Karabi Das  

29. Influence of current density on microstructure of pulse electrodeposited tin coatings  
   Materials Characterization 68, 22-32  (2012)

30. Influence of sodium saccharin on the microstructure of pulse electrodeposited Ni-CeO2 nanocomposite coating  
   By Ranjan Sen, Siddhartha Das and Karabi Das  
   J. of Nanoscience and Nanotechnology 12(10), 7944-49  (2012)
31. Introduction to Nanomaterials and Devices – Book review By S. B. Sant Materials and Manufacturing Processes in print (2013)


65. Synthesis and electrical characterization of Ba(Cd1/3Nb2/3)O3 ferroelectric compound  By M. Pastor, K. Biswas Materials Chemistry and Physics 139, 634-639 (2013)
70. Transient stage oxidation behavior of Mo76Si14B10 alloy at 1150 ºC  By Barna Roy, J. Das and R. Mitra Corrosion Science 68, 231-237 (2013)

Papers Presented in Conferences


5. Comparison of data driven and analytical blast furnace models for minimizing input carbon rate, By K. Rajesh,N.Chakraborti, P K Sen, KOMPLASTECH 2013, Zakopane, Poland, (2013)


9. Development of ultra-fine and bimodal ferrite grain structures by rapid inter-critical annealing, By A. Karmakar, D. Chakrabarti, 3rd Int. Conf. on Thermomechanical simulation and processing of steel, RDCIS, SAIL, Ranchi, (2012)


27. Refinement of ferrite grain size by single-pass and multi-pass deformation, By S. Patra, D. Chakrabarti, V. Kumar, A. Haldar, 3rd Int. Conf. on Thermomechanical simulation and processing of steel, RDCIS, SAIL, Ranchi, (2012)

28. Structural and electrical characterization of La0.8Sr0.2Ga0.8Mg0.2O2.8 electrolyte for solid oxide fuel cell, By Ramesh Chandra Biswal and Koushik Biswas, 6th India-Singapore Joint Physics Symposium (ISJPS 2013) on Physics of Advanced Materials, IIT Kharagpur, (2013)


Department of Mining Engineering

**Head**
Prof. Karanam Uma Maheshwar Rao

**Professors**

Bhattacharya, Jayanta  
*Ph.D. (IIT Kharagpur)*, Environmental Engineering and Management 
Social Impacts Mine Planning and Reliability Engineering

Bhattacherjee, Ashis  
*Ph.D. (Penn-State)*, Occupational Health and Safety and Operations 
Research applications in mining

Das, Samir Kumar  
*Ph.D. (ISM Dhanbad)*, Strata Control and Rock Mechanics, Mines 
Safety Engineering, Mine Environment

Deb, Debasis  
*Ph.D. (Alabama Univ, USA)*, Rock Mechanics, Numerical 
modelling, Mine Design, Ground Control

Mukhopadhyay, Subir Kumar  
*Ph.D. (IIT Kharagpur)*, Mine Planning and Design, Underground 
Metalliferous Mining, Surface Mining (Open pit/ Opencast/ Quarry/ On 
& Offshore Placer), Mine Safety Mining Laws and Mine 
Management, Mine and Mineral Economics Valuation Trade & 
Stockpiling, Small-scale Mining and Sustainable Development in 
Mining

Pal, Samir Kumar  
*Ph.D. (IIT Kharagpur)*, Geomechanics - Roof fall prediction in 
underground coal mines, Mine Void Filling – Blind backfilling of 
abandoned mines using sand and other waste material, Wear of 
Elastomers in Mining – Abrasion of elastomers against different rock 
types.

Pathak, Khanindra  
*Ph.D. (London Univ)*, Environmental Management in Surface 
Mining, Safety and Productivity of Mining Machinery, Application of 
Remote Sensing and GIS, Vetiver System Implementation for CSR-
EMP Integration, Oil Spill Management

Rao, Karanam Uma  
*Ph.D. (IIT Kharagpur)*, Rock Mechanics, Mine 
Development, Underground Metal Mining, Back filling of mine voids

Sastry, Bhamidipati Suryan  
*Ph.D. (Utah)*,

**Associate Professors**

Chakravarty, Debashish  
*Ph.D (IIT Kharagpur)*, Mine Mapping and Locational Surveillance using 
Digital Photogrammetry, GeoResource Exploitation using 
Geoinformatics and GPS & GIS, Mineral Resource Mapping using 
Geodesy and InSAR Technologies, Geotechnical Stability Analysis of 
Slopes using Numerical Modelling, Hyperspectral Imaging for Mineral 
Identification

Majumder, Arun Kumar  
*Ph.D. (Univ. of Queensland)*, Mineral Processing, Coal Washing, Solid-
Fluid Interactions, Fine Particle Processing

Samanta, Biswajit  
*Ph.D. (IIT Kharagpur)*, Mine planning, Geostatistics, Mine environment 
and ventilation

**Assistant Professors**

Dey, Kaushik  
*Ph.D. (ISM, Dhanbad)*, Rock excavation blasting mechanised rock 
cutting surface mining

Patra, Aditya Kumar  
*Ph.D. (Imperial College, London)*, Air pollution measurement and 
modelling, Greenhouse gas emissions from mines, Human vibration in 
mines and allied industries, Industrial safety assessment and audit

Prusty, Basanta Kumar  
*Ph.D. (Southern Illinois)*, Coalbed methane and shale gas, Geological 
Carbon Sequestration, Clean Coal Technology (UCG and CTL)

Faculty Appointments
Abhiram Kumar Verma  Assistant Professor
Kaushik Dey  Assistant Professor
Arun Kumar Majumder  Associate Professor

Brief Description of on-going activities

Environment and Safety- Application of LCA, GIS and remote sensing for soil and water analysis as a part of mine closure planning; Experimental and computational fluid dynamics studies for shock loss determination in mine air flow; Biological and passive treatment of mine waste water; Investigation of soil and water contamination vis-à-vis land use changes near mining fields. Study of human behaviour related accidents in mines; Epidemiological investigations to identify possible risk factor of occupational injuries in mines; The statistical methods for assessing risk factors included logistical regression, loglinear modeling and structural equation modeling.

Rock Mechanics / Ground Control- Finite element analysis for longwall strata control problems, and design of shield supports; Rock Joints and their influence on the stability of underground openings; Rock Mass characterization, Land reclamation and soil mechanics; Assessment of Fly ash composites as a substitute fill material for underground mine voids; Risk analysis for the safety management of coalmines; On the mechanics of rock fragmentation by drilling and cutting- studies on the linear cutting machine (LCM).

Mine Planning / Modeling- Application of various grade estimation techniques namely kriging, cokriging, stochastic simulation and neural networks for estimation of mining blocks for quality control in mines; Investigation of different statistical quality control techniques including univariate and multivariate control charts for controlling the grade of mineral at various locations; Grade control aspects in limestone and bauxite operations. Fault Tree Analyses and algorithm development for a Coal Handling Plant.

Collaborative Research- Collaborative research is ongoing with the French National Institute of Health and Medical Research (INSERM) for conducting research on injury epidemiology. In this study, the public health prevention methods were applied to occupational injuries in mines. The Department has signed a MoU with the Geotechnical Division of the Korean Institute of Geosciences and Mineral Resources (KIGAM) for undertaking a joint collaborative research on the rock mass characterization based on the image processing techniques.

Advanced Surveying & Geoinformatics: Integration of GPS & I.SAR ground deformation data over mining areas. Use of lasers for assessment of stability of dumps. Vision based semi-automatic mine navigation system.

Thrust Areas

1. Rock Mechanics and Ground Control
2. Surface and sub-surface Environment
3. Mine Safety and Systems Engineering
4. Advanced Surveying and Geo-informatics
5. Safety Engineering
6. Clean Coal Technology
**New Acquisitions**

1. Los Angles Abrasive tester
2. Flicker tester LED based
3. Bomb Calorimeter Model 6100 EF
4. Autoclave
5. Pneumatic trainer Ron make cat No. 4030
6. Dust Track DRX
7. Centrifugal Pump (closed circuit)
8. Electro Hydraulic trainer
9. Temperature controlled gas desorption on canister with portable gas measurement system
10. Refrigerated Centrifuse High Speed (Make – REM 1 without rotor head) model C-24BL
11. Experimental set-up for the 2nd part of Slurry flow
12. 4800 Start synth Microwave synthesis Lab Station
13. Pilot Plant for Air Pollution control Equipment (Bagfilter)

**International Collaborations**

French National Institute for Health and Medical Research, Korea Institute of Geosciences and Mineral Resources, Southern Illinois University Carbondale, USA, Romania, The University of Toulouse, France.

**Lectures by Visiting Experts**

1. by Mr A Chaudhary (ONGC Kolkata)
2. Factors of Vocational success by Dr M B Sharan (Ex – Faculty Humanity and Social Science IIT Kharagpur)
3. Keynote lecture delivered on Research Scholars day by Dr. B K Pal (NIT Rourkela)
4. Keynote lecture delivered on Research Scholars day by Prof S Sinha (BESU Kolkata)
5. Prospecting and Production of Petroleum and Job Prospects in OIl Industry by Shri Biman Borgohain (ONGC Kolkata)
6. Surface mine environment by Dr Jim Flatt (The University of Adelaide, Australia)
7. Full demonstration of Mines Rescue and recovery, first-aid etc. by Shri J N Ghosh (Mines Rescue Station, Sitarampur)

**Doctoral and MS Degrees Awarded**

1. Radhakanta Koner : Numerical Stability Studies for External Overburden Dumps in Wardha Valley Coalfields(PhD)
2. Dibyendu Ghosh : Application and Simulation of InSAR in Geoinformation for Ground Profile Change(MS)
4. A K Jha : Evaluation of the Effects of Surface Blasting on Adjacency Underground Workings(PhD)

**Member - Professional Bodies**

1. Pathak, Khanindra, *Life Member* - Indian Society for Technical Education
2. Pathak, Khanindra, *Life Member* - Insitution of Engineers (India)
4. Pathak, Khanindra, *Life Member* - Mining, Geology, Metallurgy Institute of India,
5. Pathak, Khanindra, *Life Member* - Acoustic Society of India
6. Deb, Debasis, *Life Member* - Indian Society of Theoretical and Applied Mechanics (ISTAM)
8. Deb, Debasis, *Life-time* - Mining, Geology and Metallurgical Society of India (MGMI)
9. Chakravarty, Debashish, *Associate* - Associate Member of IEI
10. Chakravarty, Debashish, *Life Member* - Life Member of MGMI
11. Samanta, Biswajit, *Regular* - SME (Society of Mining Engineering, USA)
12. Samanta, Biswajit, *Regular* - MGMI
13. Samanta, Biswajit, *Regular* - Institute of Engineer
14. Prusty, Basanta Kumar, *Life Member* - Mining Geological and Metallurgical Institute of India
15. Prusty, Basanta Kumar, *Member* - Institution of Engineers
16. Prusty, Basanta Kumar, *Life Member* - Society of Geoscientist and Allied Technologists, India
17. Prusty, Basanta Kumar, *Life Member* - Indian Science Congress Association
18. Prusty, Basanta Kumar, *Life Member* - Mining Engineers Association of India
19. Patra, Aditya Kumar, *Life member* - Society of Geoscientists and Allied Technologists (SGAT)
21. Patra, Aditya Kumar, *Member* - Institution of Engineers (India) (IE)
22. Patra, Aditya Kumar, *Life member* - Institution of Public Health Engineers (IPHE)
23. Patra, Aditya Kumar, *Life member* - Mining, Geological and Metallurgical Institute of India (MGMI)
24. Patra, Aditya Kumar, *Life member* - Indian Science Congress Association (ISCA)
25. Verma, Abhiram Kumar, *Life Member* - Institute of Engineers (India)
27. Dey, Kaushik, *Life Member* - Indian Society of Rock Mechanics and Tunelling Technology
28. Dey, Kaushik, *Life member* - Indian Science Congress Association
29. Dey, Kaushik, *Life Member* - Mining Geological and Metalurgical Society of India
30. Dey, Kaushik, *Life Member* - Mining Engineers Association of India
31. Dey, Kaushik, *Associate Member* - Institute of Engineers (India)
32. Majumder, Arun Kumar, *Life Member* - Institution of Engineers (India)
33. Majumder, Arun Kumar, *Life Member* - Indian Institute of Mineral Engineers
34. Majumder, Arun Kumar, *Life Member* - Indian Institute of Metals
35. Majumder, Arun Kumar, *Life Member* - Institute of Standard Engineers
36. Pal, Samir Kumar, *Fellow* - The Institution of Engineers (India)
37. Pal, Samir Kumar, *Life Member* - The Mining, Geological and Metallurgical Institute of India
38. Mukhopadhyay, Subir Kumar, *Chartered Engineer (Regular)* - The Institution of Engineers (India) Estd. 1923
40. Mukhopadhyay, Subir Kumar, *Senior Life Member* - Indian Society of Technical Education
41. Mukhopadhyay, Subir Kumar, *Senior Life Member* - Mining Engineers Association of India
42. Bhattacharya, Jayanta, *Member* - Mining Geological and Metallurgical Institute of India
43. Bhattacharya, Jayanta, *Member* - Indian Society of Technical Education
44. Bhattacharya, Jayanta, *Member* - Institution of Engineers India
45. Bhattacharya, Jayanta, *Fellow* - Indian National Acedemy of Engineering
46. Rao, Karanam Uma Maheshwar, *Fellow Institution of Engineers FIE-112784* - Institution of Engineers - FIE
47. Bhattachjerjee, Ashis, *Life Member* - Mining, Geological and Metallurgical Institute of India
48. Bhattachjerjee, Ashis, *Life Member* - The Institution of Engineers India

**Member - Editorial Board**

2. Bhattacharya, Jayanta (2012) *Member of the Editorial Board* - Institution of Engineers India Transactions on Material Science, Metallurgy and Mining
3. Majumder, Arun Kumar (2011) *Member of the Editorial Board* - World Environment
7. Rao, Karanam Uma Maheshwar (0) *Member. Editorial Board* - International Journal of Earth Sciences And Engineering
9. Samanta, Biswajit (2008) *Associate Editor* - Transactions of SME
10. Samanta, Biswajit (2008) Associate Editor - Mining Engineering

Awards & Honours

1. Chakravarty, Debashish (2010) Award of Merit from IEI for one of the Technical Papers
4. Bhattacharya, Jayanta (2000) Certificate of Merit for the year by the Institute of Engineers
5. Bhattacharya, Jayanta (1997) Coal India Gold Medal for their research paper published in the Journal of Institution of Engineers (I)
10. Bhattacherjee, Ashis (2012) Eminent Mining Engineering Award by the Institution of Engineers (India)
11. Chakravarty, Debashish (2001) German Government Fellowship for postdoctoral research
15. Mukhopadhyay, Subir Kumar (2009) Honour (Engraved Pleque) of Eminent Mining Engineer from The Institution of Engineers (India) Estd. 1923, to deliver memorial lecture
16. Verma, Abhiram Kumar (2012) IEI Young Engineers Award
20. Das, Samir Kumar (1998) Institute of Engineers (India) Certificate of Merit
22. Deb, Debasis (2009) Institutes Silver Medal (MGMI)
23. Dey, Kaushik (2010) ISRMTT Best Paper Award
26. Majumder, Arun Kumar (2005) Khare Award (IIME Best Presented Paper Award on Beneficiation) for the paper titled A Comparative Study on Magnetite Medium Behaviour Inside a Heavy Medium Cyclone and a Vorsyl Separator presented in
27. Mukhopadhyay, Subir Kumar (2009) Lala Ramkishore Singhal Award (Gold Medal) (2008-09) A lifetime award for outstanding contribution in the field of conservation of minerals in India
31. Majumder, Arun Kumar (2007) National Design Award in Mining Engineering 2007 for outstanding contribution in the field of mining (mineral) engineering design by the National Design and Research Forum of The Institution of Engineering
33. Dey, Kaushik (2012) Rajendraprasad Memorial Award (IE(I))
34. Pathak, Khanindra (2009) Sir John Dunn Medal
35. Pathak, Khanindra (2007) Smt Bala Tandan Award of MGMI
37. Pal, Samir Kumar (2003) Sukumar Rakshit Award
38. Das, Samir Kumar (2001) Sukumar Rakshit Award by MGMI
40. Das, Samir Kumar (2009) The Institution of Engineers (India) awarded me the Dr Rajendra Prasad award for the year 2009 for the paper titled Consolidation Characteristics of Stowed Pond Ash and Pond Ash Lime Mixture, Jl of th

Sponsored Research Projects

1. An Investigation on Adsorption Characteristics of Indian Coals and to Ascertain Recoverability of CBM from Deep-Seated Coal and Lignite Resources* (Coal India Limited, Kolkata, Rs.90.07 Lakhs)
2. Assessment Of Cracked Zone In The Post - Blast Walls Of Surface & Underground Excavations (ISIRD, SRIC, IIT Kharagpur,. Rs.5.00 Lakhs)
3. CO2 Sequestration in Abandoned Coal Mine - A Feasibility Study" (DST, Rs.27.60 Lakhs)
4. CO2 Sequestration in Abandoned Coal Mines - A Feasibility Study (DST, Rs.23.40 Lakhs)
5. CO2 Sequestration in Abandoned Coal Mines – A Feasibility Study (DST, Rs.27.60 Lakhs)
6. Design and development of application tool for differential InSAR technique to determine ground surface movement (KCSTC, ISRO, Rs.30.00 Lakhs)
7. Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning (Department of Higher Education, MHRD, Rs.0.00 Lakhs)
8. Development and application of a new partition curve for cyclones (Tega Industries Limited, Rs.21.00 Lakhs)
9. DEVELOPMENT OF A MATHEMATICAL MODEL FOR PREDICTING THE FISH-HOOK EFFECT IN HYDROCYCLONE CLASSIFIERS (ISIRD, SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
10. Development of Indigenous Tools for carrying out Random Sampling & Testing of Explosive and Accessories used in mines of Coal India Limited (CMPDI (Coal India Limited), Rs.0.00 Lakhs)
11. Development of roof fall prediction system for underground mines using wireless network (Coal India Ltd, Rs.216.98 Lakhs)
12. Development of RS-GIS based database for Uranium Mining and Milling in the West Khasi Hills district, Meghalaya (BRNS, Rs.32.00 Lakhs)
13. Development of rubber compound and repair techniques for trailing cables of underground mining machines (Coal India Ltd, Rs.187.84 Lakhs)
14. Development of rubber compound and repair techniques for trailing cables of underground mining machines (Coal India Limited, Rs.187.84 Lakhs)
15. Development of soft computing model to forecast the capacity of powered support for Indian geo-mining condition (SRIC-DST, Rs.9.00 Lakhs)
16. Dispersion of particulate matter from deep opencast mines (ISIRD, SRIC, Indian Institute of Technology Kharagpur, Rs.5.00 Lakhs)
17. Diversion of forest land for mining and other allied activities (Steel Authority of India Limited, Rs.27.30 Lakhs)
18. Diversion of forest land for mining and other allied activities (Steel Authority of India Limited, Rs.27.30 Lakhs)
19. Effect of Mining on Water Regime (SAIL, Rs.27.80 Lakhs)
20. Effects of Mine Tailing and Jarofix leaching on Water Contamination (Hindustan Zinc Limited, Rs.19.00 Lakhs)
21. Green House Gas Emission: Assessment of Coal Bed Methane Potential (European Union, Rs.118.00 Lakhs)
22. Green house gas recovery from coal mines and unmineable coal beds and conservation to energy (European Commission - Imperial College London, Rs.116.38 Lakhs)
23. Green house gas recovery from coal mines and unmineable coal beds and conservation to energy (EU Contribution, Rs.116.38 Lakhs)
24. Greenhouse Gas Recovery from coal mines and unmineable coalbeds and conservation to energy. (European Union, Rs.116.00 Lakhs)
25. Investigation on Augmentation of Life of Dump-Truck Tyres through the Improvement of Tyre Retreading Compound-Phase II (Coal India Limited, Rs.64.37 Lakhs)
26. Investigations of Bolt Behaviour in Development and Depillaring Panels under Blast Induced Dynamic Loading (CIL R&D Board, Rs.229.00 Lakhs)
27. Modeling Extent of Overbreak and Cracked Zone due to Blasting in Tunnels of Hydro-Electric Projects (CSIR, Rs.20.84 Lakhs)
28. National Mission on Education through Information and Communication Technology - NMEICT (MHRD, Rs.-0.00 Lakhs)
29. Numerical and Analytical Study of Crack Propagation Through Rock (ISIRD-SRIC, Rs.5.00 Lakhs)
30. Pedagogy Project for Mine Ventilation (MHRD, Rs.0.00 Lakhs)
31. Re-application of Model Studies on Gravity Blind Backfilling Method and Evaluation of a Pre-jamming Indication Parameter in the Field (Ministry of Coal, New Delhi, Rs.402.66 Lakhs)
32. Studies on shrinkage swelling characteristics of some Indian coals to ascertain recoverability of CBM from deep seated coal and shale resources (CMPDI, Central Mine Planning & Design Institute Limited, Rs.126.90 Lakhs)
33. Studies On Shrinkage Swelling Characteristics Of Some Indian Coals To Ascertain Recoverability Of Cbm From Deep Seated Coal And Shale Resources (CIL R&D, Rs.126.90 Lakhs)
34. Study of the Behavior of Oil Spill on Ocean Surface through Laboratory experiments, modeling and Satellite Image (Ministry of Earth Science, GoI, Rs.78.00 Lakhs)
35. Technical Study of Old and Active OB Dumps of WCL for Dimensional Optimization (CIL R&D Board, Rs.359.29 Lakhs)
36. The environmental impact of coal mines closure and ecological rehabilitation of mining area of India and Romania (Department of Science and Technology, Rs.5.20 Lakhs)
37. Underground coal gasification and its process optimisation for sub-bituminous coals of India by a laboratory study (SRIC, IIT, Rs.5.00 Lakhs)
38. Use of hyperspectral remote sensing for mineral identification and mapping (STC, ISRO, Rs.14.90 Lakhs)
39. Virtual Laboratory for mine automation and vitural reality (MHRD, Rs.56.00 Lakhs)

Consultancy Projects

1. Applied Rock and Soil Mechanics Works for Mine Design System in UCIL mines (RSMW) (Uranium Corporation of India Ltd. (UCIL) GoI, Rs.9.88 Lakhs)
2. Aresting flow of fines from fines heaps at Gua ore mines (SAIL, Rs.0.80 Lakhs)
3. ‘Sealed-off Area Monitoring by Video Photography at Kunustoria Colliery’ (Eastern Coalfields Limited, Kunustoria Colliery, Burdwan, Rs.1.86 Lakhs)
4. Blast design for a drive with a single boomer for 38 mm blasthole and post blast monitoring for safe blast design in haulage road (MOIL, Rs.4.00 Lakhs)
5. Blast design for a drive with a single boomer for 38mm dia blasthole and post blast monitoring for safe blast design in haulage road at Balaghat mine, (Manganese Ore India Ltd., Nagpur, Rs.4.03 Lakhs)
6. Blast Vibration Studies for the Mining Operations (Bheema Cements, Rs.2.10 Lakhs)
7. Blast Vibration Study at Kaliapani Chromite Mine of Balasore Alloys Limited (SKCM) (Balasore Alloys Limited, Jaipur, Orissa, Rs.0.40 Lakhs)
8. Coal as Raw Materials for Thermal Power Generation (The Orissa Power Generation Corporation Limited, Rs.0.79 Lakhs)
9. Consultancy by IIT-KGP for compliance of FC & EC Conditions of KIOM-MIOM, (SAIL, Rs.22.00 Lakhs)
10. Consultancy by IIT-KGP for compliance of FC & EC Conditions of Manaoharpur Iron Ore Mines, Chiria, (SAIL, Rs.11.50 Lakhs)
11. Design and Stability Analysis of Crown/ Sill Pillars below A Filled Stope (Hutti Gold Mines Ltd. A Govt. of Karnataka Undertaking, Rs.10.97 Lakhs)
12. Design of air-cooling system at SCCL mine, Kothagudem (SCCL, Rs.3.75 Lakhs)
13. Design, development and demonstration of a new hydrocyclone to analyze the feasibility of generating different quality of overflows simultaneously (Tega Industries Limited, Rs. 50,56,200.00 Lakhs)
14. Determination of IPT and CPT of Jhillimili mine (SEC L, Rs. 0.40 Lakhs)
15. Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning through ICT (Pedagogy Project; National Mission Project on Education through ICT, Rs. 0.60 Lakhs)
16. Environmental impact assessment for fly-ash mixed dumping in JOCCM#1 (USPL, Rs. 5.10 Lakhs)
17. Evaluation of sealed off areas at Moonidih Mine, India (Southern Illinois University Carbondale, U.S.A., Rs. 9.85 Lakhs)
18. Feasibility studies of underground mining in weathered rock in Kaliapani Chromite Mines of Balasore Alloys Ltd (Balasore Chromite Mines, Rs. 4.95 Lakhs)
19. Feasibility Study of Sublevel in iod-4, F/W-A (Uranium Corporation of India Limited (UCIL), Rs. 3.90 Lakhs)
20. Geo-Environmental Study for Fly-Ash Mixed Dumping in JPOCCM (JPL, Rs. 5.20 Lakhs)
21. Geotechnical Instrumentation Monitoring and Data Analysis for Sub Level Open Stope at Bangur Chromite Mines (Underground) (GIMD) (The Orissa Mining Corporation, A Govt. of Orissa Undertaking, Rs. 3.02 Lakhs)
22. Geotechnical Instrumentation, Monitoring and Data Analysis for open blast hole stoping at Khetri Copper Mine (Underground) (Hindustan Copper Limited, Khetri Copper Complex, P.O-Khetri Nagar - 333504, Dist. - Jhunjhunu (Raj., Rs. 7.10 Lakhs)
23. Geotechnical instrumentation, monitoring and data analysis for open blast hole stoping at Khetri Copper Mine (underground) (Hindustan Copper Ltd, Rs. 7.12 Lakhs)
25. Geotechnical Study at Kaliapani Chromite Mines (Phase - I, II, and III) (Balasore Alloys Limited, Rs. 21.21 Lakhs)
26. Geotechnical Study for Subsidence of Sukinda Mines of Balasore Alloys Ltd (Balasore Alloys Limited, Rs. 4.90 Lakhs)
27. Geotechnical Study of Enhancement of Waste Dump Height at our Sukinda Mines (Chromite) (INDIA METALS & FERRO ALLOYS LTD IMFA Group, IMFA Building, Jajpur, Orissa, India., Rs. 4.00 Lakhs)
28. Geotechnical Study of Enhancement of Waste Dump Height of Sukinda Mines (Indian Metals & Ferro Alloys Limited (IMFA), Rs. 4.93 Lakhs)
29. Heightening the tailings dam embankment at Sukinda Chromite Mines (Tata Steel, Rs. 2.50 Lakhs)
30. Impact Assessment of Stopping of the L1 W2 Stope on the Settling Tanks of the Mine Water Treatment Plant (STMW) (Uranium Corporation of India Ltd. (UCIL), Rs. 11.48 Lakhs)
31. Intent for Slope Stability Study of Overburden Dump at TRB Iron Ore Mines, Tenasa, Jharkhand (TRBI) (Jindal Steel and Power Ltd., Sundargarh, Orissa, Rs. 3.65 Lakhs)
32. Monitoring of Strata Movement of Pit Slope (Balasore Alloys Ltd, Rs. 1.80 Lakhs)
33. Numerical Modelling of Tailings Pond Dam for TATA SCM (SCM, TATA, Rs. 2.60 Lakhs)
34. Performance Measurement of Surface Miner and Cost Benefit Analysis (NALCO, Rs. 3.90 Lakhs)
35. Pit Slope Stability of Limestone Mines of Ambuja Cement Ltd (Ambuja Cement Ltd., Rs. 2.95 Lakhs)
36. Rock Mechanics Study at Narwapahar UCIL Mines (Phase I-II) (Uranium Corporation of India Limited (UCIL) Gol, Rs. 6.00 Lakhs)
37. Rock Stability Analysis of Decline and Design of Vertical Shaft Lining at Mohuldih Uranium Mine (Uranium Corporation of India Limited (UCIL) (Gol), Rs. 3.40 Lakhs)
38. Slope Stability Assessment, Safe Overall Pit Slope Study and its control measures at Majhgawan Diamond Mine, Panna (National Mineral Development Corporation, Rs. 5.68 Lakhs)
39. Slope Stability studies for Rawan Captive Limestone mine in Raipur (Ambuja Cements Ltd., Rs. 4.50 Lakhs)
40. Slope Stability Studies for Rawan Captive Limestone Mine in Raipur District of Chhattisgarh (Ambuja Cement Corporation, Rs. 4.95 Lakhs)
41. Slope Stability Studies for Rawan Captive Limestone Mine in Raipur District of Chhattisgarh (Ambuja Cements Ltd., Rs. 4.95 Lakhs)
42. Slope Stability, safe over all pit slope study and its control measures at Majhgawan Diamond Mine (NMDC, Rs.5.68 Lakhs)
43. Slope stabilization by Vetiver System Technology (Tata Steel, Rs.24.00 Lakhs)
44. Stability and strength test for Q-0, Dungri limestone Quarry (ACC Ltd, Rs.1.65 Lakhs)
45. Stability of Dump Slopes at Sukinda chromite mines, Sukinda. (TISCO -Tata Iron & Steel Co. Limited, Rs.12.00 Lakhs)
46. Stability Study of RCC Stack of Unit No. 5 (Hindalco Industries Limited, Rs.12.99 Lakhs)
47. Slope Design and its Stability Analysis at Narwapahar Mine, UCIL (Uranium Corporation of India Ltd., Govt.of India Enterprise, Rs.2.85 Lakhs)
48. Stope and Pillars Design at Narwapahar Mine (140mRL to 230 mRL), UCIL (Uranium Corporation of India Ltd., Govt. of India Enterprise, Rs.3.15 Lakhs)
49. Study of Dump Stability at Sukinda Chromite Mines, Tata Steel (Tata Steel, Rs.12.22 Lakhs)
50. Study of Pit Slope Stability in Kaliapani Chromite Mines of (Balasore Alloys Limited, Rs.3.00 Lakhs)
51. Study of Pit Slope Stability of Ari Dongri Iron Ore Mines (GPIL, Rs.4.66 Lakhs)
52. Study of Pit Slope Stability of Ari Dongri Iron Ore Mines (Godavari Power and Ispat Limited, Rs.4.66 Lakhs)
53. Study of ventilation system at Boula Chromite mine (FACOR, Rs.0.80 Lakhs)
54. Study on intensity of noise and vibration due to non-blasting mechanical mining operations. (VTBM) (M/s. Birla Corporation Ltd., Rs.9.83 Lakhs)
55. Study Project for determining suitability of Surface Miners at NALCO Mines, Damanjodi, Orissa (NALCO, Rs.8.60 Lakhs)
56. Subsidence Study at ICC Group of Mines (HCL, Rs.17.00 Lakhs)
57. Subsidence study of Surda, Kendadih and Rakha mining areas (Hindustan Copper Limited, Rs.17.68 Lakhs)
58. Survey of Defense Land, Barrack pore Cantonment (Cantonment Board, Rs.11.00 Lakhs)
59. Survey of Defense Land, Jalnapahar Cantonment (Cantonment Board, Rs.6.00 Lakhs)
60. Survey of Defense Land, Lebong Cantonment (Cantonment Board, Rs.5.00 Lakhs)
61. Techno Feasibility study for an Incline shaft and Primary Drivages for Underground Mining in lode No. 6 at Kaliapani Chromite Mines (Balasore Alloys Limited, Rs.7.00 Lakhs)
62. Techno-feasibility study for an Incline, shaft and primary drivages for underground mining in lode no.6 at ISPAT Chromite mines (Balasore Alloys Ltd, Rs.7.06 Lakhs)
63. Testing of Core Sample and Soil Sample (Balasore Alloys Limited, Rs.2.00 Lakhs)
64. Testing of Core Samples and Soil Samples (Balasore Alloys Limited, Rs.2.12 Lakhs)
65. Time and Motion study of Dumper and Shovels in Kaliapani Chromite Mine of Balasore Alloys Ltd. (Balasore Alloys Limited, Rs.1.00 Lakhs)
66. Time and Motion Study of Dumpers and Shovels in Kaliapani Chromite Mines (Balasore Alloys Ltd., Rs.1.06 Lakhs)
67. Uniaxial and tensile strength test of core and block sample of Jungle and Maheswar Lode, Kathpal Mines (Ferro Alloys Corporation Ltd Laxmi Bhawan Kuans, Bhadrak – 756 100, Orissa, India, Rs.0.60 Lakhs)

Visits Abroad by Faculty Members

1. Majumder, Arun Kumar - To attend and present a paper in an International conference (Marrakech, Morocco, ) May 9-13, 2011
2. Bhattacharya, Jayanta - To teach a course on Reclamation Engineering and Sustainability (Western Australia School of Mines, Curtin Univ. Australia, ) A Week in April 2012
4. Bhattacherjee, Ashis - Invited lecture (National Institute of Occupational Safety and Health, Pittsburgh, USA,) 2 hours
6. Prusty, Basanta Kumar - Delivering lecture, Lab visit, collaborative research (INGV Roma, Italy, ) 3-10 July 2011
7. Majumder, Arun Kumar - Visiting Professor of the University of Paul Sabatier (Toulouse, France, ) December 1-23
Invited Lectures by Faculty Members

1. Fundamentals of Coal Preparation & Modeling on Gravity Concentration Unit Operations by Majumder, Arun Kumar (IICM, Ranchi)
2. Delivered Four Lectures in a short course organised by ISM, Dhanbad by Majumder, Arun Kumar (M N Dastur, Kolkata)
3. Delivered Four Lectures on Fundamentals of Mineral Processing by Majumder, Arun Kumar (Toulouse, France)
4. Delivered Four Lectures on Solid-Fluid Interactions by Majumder, Arun Kumar (Toulouse, France)
5. Innovative Approach in Modeling Gravity Concentration Unit Operations by Majumder, Arun Kumar (Tata Steel, Jamshedpur)
6. Delivered Six Lectures on Fine Particle Processing by Majumder, Arun Kumar (National Metallurgical Laboratory, Jamshedpur)
7. SAFE BLASTING TECHNIQUES FOR SURFACE AND UNDERGROUND EXCAVATION by Dey, Kaushik (IIT Kharagpur)
8. Controlled blasting techniques in surface mining operations by Dey, Kaushik (Rourkela)
9. TECHNIQUES OF FRAGMENTATION CONTROL IN SURFACE MINES AND ITS IMPACT ON PRODUCTIVITY by Dey, Kaushik (IIT Kharagpur)
10. SELECTION, PLANNING AND OPERATION OF SURFACE MINER by Dey, Kaushik (IIT Kharagpur)
11. Problems in Drilling and blasting by Dey, Kaushik (IIT Kharagpur)
13. Modes of rock mass failure in mines- based on case histories by Rao, Karanam Uma Maheshwar (NITK Surathkal)
14. Rock Mass response to the change in stresses and Modes of failure. by Rao, Karanam Uma Maheshwar (Department of Mining IIT BHU)
15. Principles of Mine Development by Rao, Karanam Uma Maheshwar (Department of Mining Engineering, South Dakota School of Mines, USA)

Books Published


Short-Term Courses, Training Programmes and Workshops organised

1. Accident Prevention and safety Management in Mines (November 6-9, 2012)
2. Environmental control in mining and allied industries (12 - 14 October 2011)
3. Environmental Control in Mining and Allied Industries (12-14 Oct 2011)
5. Project Land Acquisition,CSR and Sustainable Development (20-23 Feb, 2013)

Papers Published in Journals

1. A Methodology for Assessment of Carrying Capacity of a River in Mining Area, , , By Shivam Shahi, Animesh Ranjan and K. Pathak Global Journal of Applied Environmental Sciences V 1, No. 1 pp. 31-46 (2011)


27. Sweetmeat waste fractions as suitable organic carbon source for biological sulfate reduction by Bidus K. Das, Samiran S. Gauri, Jayanta Bhattacharya International Biodeterioration and Biodegradation Accepted (2013)


Papers Presented in Conferences


14. SPH Procedures for Failure Analysis of Circular Rock Disk under Distributed Arc Loading, By D. Deb and R. Pramanik, 10th International Symposium on Rock Fragmentation by Blasting (FRAGBLAST 10), New Delhi, (2012)


Department of Ocean Engineering & Naval Architecture

Head
Prof. Om Prakash Sha

Professors
Mandal, Nisith Ranjan
Dr.Inz.(Poland), Wave and Tidal Energy, Computational Weld Mechanics and Welding Technology

Misra, Suresh Chandra
Ph.D.(Newcastle UK), Coastal Hydrodynamics Hydroelasticity

Sahoo, Trilochan
Ph.D.(IISc Bangalore), Coastal Hydrodynamics Hydroelasticity

Satsangi, Subir Kumar

Sen, Debaratna
Ph.D.(Canada), Free Surface Hydrodynamics, marine hydrodynamics, Dynamics of Marine Vehicles, Wave structure Interactions

Sha, Om Prakash
Ph.D.(IIT Kharagpur), Marine Design and Production

Associate Professor
Bhaskaran, Prasad K
Ph.D (Kurukshetra), Wind-Wave Modeling, Marine Acoustics, Coastal Processes, Coastal Sediment Dynamics, Physical & Dynamical Oceanography, Ocean Wave Climate Projections

Assistant Professors
Bhar, Ashoke
Ph.D.(IIT Kharagpur), Marine Structural Engineering

Vishwanath, Nagarajan
Ph.D.(Osaka Univ. Japan), Ship motions, Rudder systems, Mathematical modelling

Warrior, Hari V
Ocean Modeling and Turbulence

Visiting Faculty
Datta, Nabanita
Ph.D.(Univ. of Michigan, USA), Marine Dynamics, Vibrations, Hydroelasticity

Faculty Appointments
Vishwanath Nagarajan Assistant Professor
Dr. Nabanita Datta Visiting Faculty
Dr. Sreekanta Das Visiting Faculty

Brief Description of on-going activities

The Department is actively involved in various sponsored R&D projects of National importance on diversified areas of Ocean Engineering & Naval Architecture. The ongoing activities of the Department includes R&D as well Consultancy projects in diversified areas such as: CFD, Marine Structures, Wind-Wave Modeling, Coastal Processes, Coastal Sediment Dynamics, Hydroelasticity, Computational Weld Mechanics and Welding Technology, Experimental and Mathematical Modeling of Ship Motions, Coastal Hydrodynamics, Ship structures, Dynamics of Marine Vehicles, Wave-Structure Interactions, Marine Design and Production, Ocean Turbulence.

Thrust Areas

New Acquisitions

1. (i) NAPA Ship Design software, (ii) ADCIRC with SMS Interface, (iii) ORCAFLEX, (iv) WAMIT (v) MAXSURF (vi) SHIPFLOW (vii) Milling machine installed in Welding Laboratory

International Collaborations

A team from the University of South Pacific visited the Department to initiate collaboration in the field of Ocean Engineering.

A team from Ngee Ann Polytechnic and Centre for Innovation (Marine & Offshore Technology) had visited this Department on 9th July, 2012. The team expressed their interest to collaborate with this Department in the mutual areas of joint research and development work.

Lectures by Visiting Experts

1. Need for new ship design with respect to present shipping scenario (commercial & regulatory requirements) by Mr. Shantanu Paul (General Manager & Dean (Engineering Studies), The Shipping Corporation of India Ltd)
2. Challenges in Wave-Structure Interaction Problems by Prof. A. Chakrabarti (Professor, IISc Bangalore)
3. Ship Building in Japan and history of Uraga Shipyard by Mr. Yoshiaki Gonno (Sumitomo Heavy Industries and Marine Engineering, Yokohama, Japan)
4. Piping Systems on Bulk Carriers and Oil Tankers by Mr. K. K. Palit (Ex Director (Technical and Offshore Services), The Shipping Corporation of India Limited, Mumbai)
5. Maritime Education and Training: Need of higher maritime education in India and possible cooperation of institutes in India by Mr. Shantanu Paul (General Manager & Dean (Engineering Studies), The Shipping Corporation of India Ltd)
6. Challenges in Marine and Offshore Technology by Dr Lim Choo Min (Senior Director, Ngee Ann Polytechnic and Centre for Innovation (Marine & Offshore Technology), Singapore)
7. Global Ocean Observing System by Avijit Gangopadhyay (Professor)
8. Challenges in Marine and Offshore Technology by Mr. Subrata Chanda (Director (Marine & Offshore), Ngee Ann Polytechnic and Centre for Innovation (Marine & Offshore Technology), Singapore)

Doctoral and MS Degrees Awarded

1. Chinmaya Prasad Padhy : Development of a Ship Routing Algorithm and Its Application to the North Indian Ocean Region(Ph.D)
2. Anindya Bhar : Finite Element Analysis of Stiffened Laminated Composite and Functionally Graded Plates Using a Higher-Order Shear Deformation Theory(Ph.D)
3. Chitra Arora : Numerical Modeling of Bottom Boundary Layer Characteristics in the Hooghly Estuary(Ph.D)

Member - Professional Bodies

1. Sahoo, Trilochan, *Life Member* - Indian Society of Theoretical and Applied Mechanics(ISTAM)
3. Bhaskaran, Prasad K, *Life Member* - Ocean Society of India
4. Vishwanath, Nagarajan, *Member* - The Japan Society of Naval Architects and Ocean Engineers
5. Satsangi, Subir Kumar, Member - Indian Society of Technical Education
6. Satsangi, Subir Kumar, Member - Indian Society of Theoretical and Applied Mechanics
7. Satsangi, Subir Kumar, Member - Institution of Marine Technologists
8. Sha, Om Prakash, Member - Royal Institution of Naval Architects, UK
9. Sen, Debabrata, Life Member - Ocean Society of India
10. Datta, Nabanita, Member - Society of Naval Architects and Marine Engineers

**Member - Editorial Board**

7. Sha, Om Prakash (2012) Editorial Board Member - International Journal of Naval Architecture and Ocean Engineering (JNAOE), Korea
10. Sha, Om Prakash (2012) Reviewer - Computer Aided Design

**Awards & Honours**

1. Satsangi, Subir Kumar (1995) Best Paper Award INCHOE
2. Misra, Suresh Chandra (2005) H S Rao memorial award for Best paper, June 04 issue of Marine Engineers Review (India)
5. Satsangi, Subir Kumar (2005) Marine Award Min. of Shipping Govt of India

**Sponsored Research Projects**

1. An investigation into the maneuvering performance of ships in navigation channels around Indian coast under different weather conditions (Naval Research Board, Rs.27.12 Lakhs)
2. Coastal Protection in the Mahakalpara area of Kendraparah District, ORISSA (Ministry of Earth Sciences, Govt. of India, New Delhi, Rs.42.32 Lakhs)
3. Development of a compositionally graded coating on marine propeller for improving cavitation corrosion resistance (Naval Research Board, Rs.35.56 Lakhs)
4. Development of a Hybrid Co-ordinate Ocean Model (HYCOM) for the Bay of Bengal (INCOIS, Hyderabad, Rs.43.00 Lakhs)
5. Development of an Integrated Ocean Wave Forecasting System and Study its impact on Coastal Structures (INCOIS, Hyderabad, Rs.47.00 Lakhs)
6. Development of Cage for Mariculture through Numerical and Physical Modeling (Ministry of Earth Sciences, New Delhi, Rs.0.00 Lakhs)
7. Development of Friction Stir Welding Process for Shipbuilding (NRB, New Delhi, Rs.16.90 Lakhs)
8. Development of high strength to weight ratio materials for the body of unmanned under water vehicle (MoES, Rs.76.02 Lakhs)
9. Experimental validation of theoretical models on sediment settling velocity and suspended sediment concentration using OCEANSAT data (NRB, New Delhi, Rs.9.56 Lakhs)
10. Implementation of an Integrated Nested Wave-Current-Surge Model with improved Air-Sea coupling parameterization for Kalpakkam region (IGCAR, Kalpakkam, Rs.32.33 Lakhs)
11. Monitoring Thermodynamical structure of Atmospheric Boundary Layer during pre-monsoon convective activity over Kharagpur (DST, New Delhi, Rs.110.00 Lakhs)
12. National Program in Marine Hydrodynamics (Naval Research Board, New Delhi, Rs.255.00 Lakhs)
13. National Programme in Marine Hydrodynamics (Naval research board, Rs.255.00 Lakhs)
14. nil (, Rs.0.00 Lakhs)
15. Ocean and Atmospheric Science Technology Cell (OASTC), IIT, Kharagpur (Ministry of Earth Sciences, Rs.6.66 Lakhs)
16. Research on ship maneuvering and propulsion performance using data from Voyage Data Recorder (VDR) and Automatic Identification System (AIS) (Ministry of Shipping, Government of India, Rs.27.48 Lakhs)
17. Research on ship maneuvering and propulsion performance using data from Voyage Data Recorder (VDR) and Automatic Identification System (AIS) (Ministry of Shipping, Rs.27.48 Lakhs)
18. Weld Induced Distortion Analysis of 3-D Large Ship Structures (DST, New Delhi, Rs.13.44 Lakhs)

Consultancy Projects

1. Calibration of water current meters (West Bengal government, Rs.0.20 Lakhs)
2. CFD Analysis of 97 metres OPV (Garden Reach Shipbuilders & engineers, Kolkata, Rs.7.30 Lakhs)
3. CFD Analysis of 1000 tonne Oil Barge (Garden Reach Shipbuilders & engineers, Kolkata, Rs.1.40 Lakhs)
4. Consultant for Project ‘Indigo (Tata Consultancy Services, Rs.55.00 Lakhs)
5. Design analysis and proof checking of 440 m long Heavy Motor Vehicle Suspension Bridge - Phase-I (PWD, Uttarakhand, Rs.96.00 Lakhs)
6. Design analysis and proof checking of 440 m long Heavy Motor Vehicle Suspension Bridge - Phase-II (Public Works Department, Govt. of Uttarakhand, Dehradun, Rs.108.00 Lakhs)
7. Design Analysis of Auxiliary Barge (Pipavav Shipyard, Gujarat, Rs.0.56 Lakhs)
8. Design Analysis of Cadet Training Ship (Pipavav Shipyard, Gujarat, Rs.0.56 Lakhs)
9. Design Analysis of Naval Offshore Patrol Vessel (Pipavav Shipyard, Gujarat, Rs.1.10 Lakhs)
10. Design of dock gate (Kolkata Port Trust, Rs.7.50 Lakhs)
11. Design of Leaf Type Lock Gate (KoPT, Rs.4.50 Lakhs)
12. Development of class rules (Axsys Technologies Ltd., Rs.1.50 Lakhs)
13. Development of software for computing added wave resistance (Indian Register of Shipping, Rs.7.50 Lakhs)
14. Dredging studies along the Persian gulf (KFUPM, Rs.2.50 Lakhs)
15. Dynamic model and trajectory simulation during entry phase of ALWT (NSTL,DRDO, Visakhapatnam, Rs.7.20 Lakhs)
16. Fabrication and resistance test of a 1500 DWT oil tanker ship model (MARINE HOUSE, DHAKA, BANGLADESH, Rs.1.93 Lakhs)
17. Hull structural analysis using FEM of one number 74m long Offshore Patrol Vessel (Garden Reach Shipbuilders and Engineers Ltd., Rs.8.00 Lakhs)
18. Hydrodynamic analysis of fishing vessels (CIFT, Cochin, Rs.5.95 Lakhs)
19. Hydrodynamic analysis of fishing vessels. (Central Institute of Fisheries Technology, Cochin, Rs.5.95 Lakhs)
20. Hydrodynamic Design & Design of Control Surfaces for AUV (Naval Science and Technological Laboratory, Visakhapatnam, Rs.13.50 Lakhs)
21. Hydrodynamic Design & Development of Trimarans and Delta Hull Forms (NSTL Vizag, Rs.21.15 Lakhs)
22. Hydrodynamic design and development of trimaran and delta hull forms (NSTL, Visakhapatnam, Rs.21.15 Lakhs)
23. Hydrodynamic design of high speed light weight torpedo (NSTL,DRDO, Visakhapatnam, Rs.22.25 Lakhs)
24. Impact of Storm Surge, Wind Waves and Seiches on the design of proposed Kalpasar Dam (Government of Gujarat, Rs.10.00 Lakhs)
25. Model Test for Self Propelled Sewage Barges Yard 446-451 (Bharati Shipyard, Mumbai, Rs.6.60 Lakhs)
26. MODEL TESTING FOR Offshore Patrol Vessel (M/s Garden Reach Shipbuilders & Engineers Ltd., Kolkata - 700 024, Rs.9.20 Lakhs)
27. Model tests for 200 tonne self propelled barge (M/s Bharati Shipyard Limited, Mumbai - 400 001, Rs.6.94 Lakhs)
28. Modeling of half moon bay (Al Wasset, Rs.2.50 Lakhs)
29. Research on ship maneuvering using PMM captive tests and validation based on full scale maneuvering experiments (NSTL, Visakhapatnam, Rs.8.00 Lakhs)
30. Research on ship maneuvering using PMM captive tests and validation based on full scale maneuvering experiments (Naval Science & Technological Laboratory, Visakhapatnam, Rs.8.00 Lakhs)
31. Resistance and self propulsion test for MOPV (Garden Reach Shipbuilders & Engineers, Kolkata, Rs.9.20 Lakhs)
32. Resistance and self propulsion test for self propelled barges (M/s Bharati Shipyard Limited, Mumbai - 400 053, Rs.6.54 Lakhs)
33. Resistance test of ship model (NOPV) (M/s. Pipavav Shipyard Ltd., Gujarat, Rs.1.23 Lakhs)
34. Ship Model Testing for NOPV (Pipavav Shipyard, Gujarat, Rs.1.24 Lakhs)
35. study of ocean currents along Al Khobar port. (KFUPM, Rs.2.50 Lakhs)

**Technology Transferred**

1. M/s. OSNAR CHEMICAL PRIVATE LIMITED, Mumbai 400 015 - FRP Road Side Crash Barrier : Rs. 2.00 Lakh

**Patents (filed / granted)**

1. Design and Fabrication of FRP Road Side Crash Barrier
2. Design and Fabrication of Stiffened Plate Panel of AA5083 by Friction Stir Welding

**Visits Abroad by Faculty Members**

1. Mandal, Nisith Ranjan - To work out Insitute level academic collaboration (Japanese Welding Research Institute, Osaka University, ) Dec.15-17, 2011
2. Mandal, Nisith Ranjan - To discuss on collaborative research work on welding technologyative research programme (Dept. of Mechanical Engineering, Hiroshima University, ) Dec.18-22, 2011
3. Mandal, Nisith Ranjan - To work out collaborative research programme (Dept. of System Integration, Yokohama National University, ) Dec.26-27, 2011
4. Bhaskaran, Prasad K - KIZUNA-BOND Project Sponsored by JICE, Japan (Japan, ) 04 - 12 February, 2013
5. Bhaskaran, Prasad K - To attend MARSIM 2012 (Singapore Polytechnic, Singapore, ) 5 Days

**Invited Lectures by Faculty Members**

1. Advanced welding techniques EGW, FSW by Mandal, Nisith Ranjan (Cochin Shipyard Ltd.)
2. Electroslag welding and single side submerged arc welding with reusable backing strip by Mandal, Nisith Ranjan (Cochin Shipyard Ltd.)
3. Effect of welding sequence on structural distortion by Mandal, Nisith Ranjan (Cochin Shipyard Ltd.)
4. Productivity improvement through Accuracy Control in shipbuilding by Mandal, Nisith Ranjan (Cochin Shipyard Ltd.)
5. Mathematical techniques for wave interaction with flexible structuresContemporary approaches by Sahoo, Trilochan (ICFMSA-2012, Calcutta Mathematical Society, Kolkatta)
6. Contemporary approaches for wave interaction with flexible structures by Sahoo, Trilochan (NIT, Durgapur)
7. Introduction to water waves and coastal processes by Sahoo, Trilochan (IMU, Visakhpatnam Campus)
Books Published


Short-Term Courses, Training Programmes and Workshops organised

1. Short term course on Practical Shipbuilding for Officers of Mazagon Dock Ltd (two weeks 4th Feb 15 Feb 2013)

Papers Published in Journals

2. Development of an automated Regional Coupled Atmosphere-Ocean modeling System for coastal Kalpakkam By Subba Reddy, Kaushik Sasmal, Hari Warrior International Journal of Ocean and Climate systems accepted (0)
10. Intensity of tropical cyclones during pre- and post-monsoon seasons in relation to accumulated tropical cyclone heat potential over Bay of Bengal By Naresh Krishna Vissa, A N V Satyanarayana, and Prasad K. Bhaskaran Natural Hazards DOI 10.1007/s11069-0 (2013)


Papers Presented in Conferences


7. Identification of Submarine Hydrodynamic Coefficients from Sea Trials Using Extended Kalman Filter, By Amit Ray and Debabrata Sen. 10th Int. Conf. on Hydrodynamics, St., Petersburg, Russia, (2012)


17. Uncertainty analysis for ship maneuvering in model scale and full scale measurements, By Anil Kumar Dash Vishwanath Nagarajan Om Prakash Sha, Tech Samudra 2012, Indian Maritime University, Visakhapatnam, (2012)
Department of Physics & Meteorology

Head
Prof. Samit Kumar Ray

Professors
Bharadwaj, Somnath  
Ph.D.(IISc Bangalore), Astrophysics, Cosmology
Chandra, Naresh  
Ph.D.(Queens Univ, UK),
Datta, Prasanta Kumar  
Ph.D.(Burdwan Univ), Ultrafast Lasers and Nonlinear Optics, Photonics
Kar, Sayan  
Ph.D.(IIT Kanpur), Gravitation and Geometry, High Energy Physics, Quantum mechanics
Kumar, Krishna  
Ph.D.(IIT Kanpur), Hydrodynamic flows, Pattern-forming instabilities
Mathur, Balbir Kumar  
Ph.D.(IIT Kharagpur), Web Based Service, Microprocessor, ERP, Thin Films
Raina, Prabhu Krishna  
Ph.D.(IIT Kanpur),
Ray, Samit Kumar  
Ph.D.(IIT Kharagpur), Semiconductor nanostructures, Condensed Matter Physics, Thin Films, Photovoltaics
Roy, Anushree  
Ph.D.(IISc Bangalore), Raman spectroscopy
Sharma, Shivcharan Lal  
Ph.D.(IIT Kanpur), Effects of Ionizing Radiation on Thin Films, Radiation Physics and Instrumentation for Ionizing Radiation, Monte Carlo Simulations, Physics of Semiconductors and Devices, Fission Dynamics
Taraphder, Arghya  
Ph.D.(IISc Bangalore), Condensed matter physics

Associate Professors
Das, Amal Kumar  
Ph.D.(IOP Bhubaneswar), Experimental Condensed Matter Physics, Magnetism including spintronics, Magnetic semiconducting nanoparticles and thin films, Mechanical and magnetic stress measurement of thin films
Dhar, Achintya  
Ph.D.(Jadavpur Univ), Organic Semiconductors, Semiconductor Nanostructures, Heterostructure Devices
Nath, Tapan Kumar  
Ph.D.(IIT Kanpur), Magnetic thin films and heterojunctions, Spintronics, Nanostructured Magnetic Materials, Magnetic Alloys, Multiferroics, Low Temperature Condensed Matter Physics, Superconductivity
Roy Chaudhuri, Partha  
Ph.D.(IIT Delhi), Fiber & Integrated Optics and Optoelectronics, Experimental Bio-Photonics & Nano-Photonics
Shukla, Pragya  
Ph.D.(JNU Delhi), Statistical Studies of Complex Systems, Random Matrices and Quantum Chaos, Theoretical Physics

Assistant Professors
Chandra, Amreesh  
Das, Baidya Nath  
Ph.D.(IIT Kharagpur), condense matter physics
Khastgir, Sugata Pratik  
Ph.D.(IOP Bhubaneswar), Mathematical Physics/High Energy Physics
Majumder, Sonjoy  
Ph.D.(IIA Bangalore), Computational Many-body physics, Atomic & Molecular Physics, Theoretical modeling of bulk and nanomaterials, Astronomy and Astrophysics
Panigrahi, Kamal Lochan  
Ph.D.(Institute of Physics, Bhubaneswar), String Theory, High Energy
Physics, String Inspired Cosmology

Singh, Ajay Kumar  Ph.D.(Calcutta Univ), Experimental Nuclear Physics, Double Beta decay studies, Compressed Baryonic Matter (CBM)

Srivastava, Sanjeev Kumar  Ph.D.(JNU, New Delhi), Materials Engineering using Ion Beams, Nuclear Condensed Matter Physics, Quantum Criticality


Visiting Faculty
Mishra, Shradha  Ph.D.,

Scientific Officer
Chakraborty, Syamal  Ph.D.(IIT Kharagpur),

Brief Description of on-going activities

The Department is carrying out research and development utilizing in-house facilities and in collaboration with sister departments. Many of the facilities have been developed in the department and procured from sponsored projects. Faculty and scholars are carrying out active research in the following areas: Astrophysical Spectroscopy, Astrophysics, Atmospheric Sciences, Atomic and Molecular Physics, Biophysics,Condensed Matter Physics, Physics of Complex Systems, Cosmology, Electronic properties of solids, ERP, Bio-Photonics, Optical Imaging, Nuclear Physics, Ferroelectricity, Fiber & Integrated Optics, Optoelectronics, Gravitation and Geometry, High Energy Physics, Hydrodynamics, Laser Physics, Nonlinear Optics, Photonics, magnetic semiconducting nanoparticles and thin films, Magnetism, Spintronics, Materials engineering, Mathematical Physics, Mechanical and magnetic stress, Microprocessors based systems, Monte Carlo Simulation of Radiation Detectors, Semiconductor Devices, Nano- and Bulk-material science, Nanostructured Magnetic Materials, Magnetic thin films and Multilayers, Multiferroics, Nanotechnology, Nonlinear Dynamics, Nonlinear instabilities, Nuclear condensed matter physics, Nuclear Structure, Double Beta Decay and Neutrino Physics, Optoelectronics, Organic Electronics, Particle and Cluster Emission in Fission and Fusion-Fission, Physics of Semiconductor Crystals and Thin Films, Quantum Many-Body Theory, Radiation Measurement Techniques, Radiation Sensors and Dosimetry, Renewable Energy Sources, Semiconductors, Nanostructures, Solid State Ionics, Thermoelectricity, Web Based Services, Engineering and characterization of materials using ion beams, String Theory

Thrust Areas

1. Condensed Matter Physics
2. Non-linear Dynamics and complexity
3. Astronomy and Astrophysics
4. Nuclear and Particle Physics
5. Optics and Photonics

New Acquisitions

1. X-ray Photo-electron Spectroscopy
2. Optical Lithography

Lectures by Visiting Experts

1. A semi-analytical approach to high redshift Univers by Dr. Saumyadip Samui (University of KwaZulu-Natal, South Africa)
2. Interacting Fröhlich and Holstein bipolarons by Dr. Monodeep Chakraborty (POSTECH, Pohang, South Korea)
3. Nonlinear dynamics in nano-structured waveguides by Dr. Samudra Roy (Max Planck Institute for the Science of Light, Erlangen, Germany)

4. Universality of Black Hole Accretion by Dr. Ritaban Chatterjee (Yale University/University of Wyoming)

5. Beauty of disorder in photonics: In the context of fiber optics and random lasing by Dr. Somnath Ghosh (Fiber Optics Group, Indian Institute of Technology, Delhi)

6. Growth and characterization of III-Nitride semiconductors and their nano-structures by Dr. Abdul Kadir (Institute of Solid State Physics, Technical University, Berlin)

7. Prospects of silicon photonics and optical interconnect technology by Prof. Bijoy Krishna Das (Department of Electrical Engineering, IIT Madras, Chennai)

8. Dark Matter Particles and Phenomenology by Dr. Subhaditya Bhattacharya (Department of Physics, University of California, Riverside, USA)

9. New approach to biophysical studies of lipid membrane by Dr. Sajal Ghosh (University of California-San Diego, USA)

10. Quaternary (InAlGaAs) capped In(Ga)As/GaAs Quantum Dot Infrared Photodetectors and Thermal Imagers by Prof. Subhananda Chakrabarty (Dept. of Electrical Engineering, IIT Bombay)

11. Quantum Information and Communication by Prof. Sougato Bose (Department of Physics and Astronomy, University College, London, UK)

12. Collective dynamics of self-propelled particles with variable speed by Dr. Shradha Mishra (Department of Physics, Kansas State University, USA)

13. Structural, magnetic and antibacterial properties of SiO-CaO-P2O5-Fe2O3 based biocompatible nano-crystalline glass/glass-ceramics by Dr. G P Kothiyal (Bhabha Atomic Research Centre, Mumbai)

14. Life at the Edge: Quantum physics on manifolds with boundary by Prof. T. R. Govindarajan (Institute of Mathematical Sciences, Chennai)

15. Raman studies on Multiferroics by Prof. N. Chandrabhas (Chemistry and Physics of Materials Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore)

16. Weakening gravity at small distances and times by Prof. Anupam Mazumdar (Physics Department, Lancaster University, UK)

17. Micro-Extension Rheometer with feedback loop for microscale samples by Dr. Chirag Kalelkar (in transit from MIT to join IIT Mandi)

18. Topologically massive higher-spin gravity by Dr. Bindusar Sahoo (Nikhef theory group Amsterdam, Holland)

19. Theoretical aids in screening candidates for atomic clocks: Illustration for Yb II using coupled-cluster based linear response theory by Prof. Rajat K Chaudhuri (Indian Institute of Astrophysics, Bangalore)

20. Quantum Phase Transition of Light: Cavity Quantum Electro Dynamics by Dr. Sujit Sarkar (PoornaPrajna Institute of Scientific Research, Bangalore)

21. The Physics of Quasiperiodic Order by Prof. Arunava Chakrabarti (Department of Physics, University of Kalyani)

Doctoral and MS Degrees Awarded

1. Sanjit Das : Geometric flows without and with higher order and higher derivative terms(Ph.D.)
2. Purnima Singh : Structural Evolution in 125I, 123I and 122I with Increasing Angular Momentum.(Ph.D)
3. Anirban Sarkar : Development of Cantilever Beam Magentometer for in situ characterizations and studies on heterostructure based magnetic diode(Ph.D)
4. Pratap Kumar Swain : Semiclassical Strings and D-branes in Diverse String Backgrounds(Ph.D)
5. Susanta Kr. Mohanta : Local Magnetic Behaviour of Isolated Impurities in Solids(Ph.D)
7. S.K. Ghorui : Double Beta Decay Study of Some Nuclei in the Mass Range A=76 to 150 within the Deformed Hartree-Fock Model(Ph.D)

**Member - Professional Bodies**

1. Datta, Prasanta Kumar, *Member* - SPIE (USA)
2. Datta, Prasanta Kumar, *Regular* - Optical Society of America
3. Datta, Prasanta Kumar, *Life* - Indian Laser Association
4. Datta, Prasanta Kumar, *Regular Associate* - International Centre for Theoretical Physics, Trieste, Italy
5. Nath, Tapan Kumar, *Life Time Member* - Magnetic Society of India
6. Nath, Tapan Kumar, *Life time member* - Material Research Society of India
7. Nath, Tapan Kumar, *Full Member* - American Nano Society
8. Roy Chaudhuri, Partha, *Life Member* - Indian Science Congress Association, ISCA
9. Roy Chaudhuri, Partha, *Life Member* - Optical Society of India, OSI
10. Roy Chaudhuri, Partha, *Regular* - Optical Society of America, OSA
11. Roy Chaudhuri, Partha, *Life Member* - Institute of Electronics & Telecommunication Engineers, IETE
12. Roy Chaudhuri, Partha, *Regular* - KIT Internation Exchange Club, Japan
13. Srivastava, Sanjeev Kumar, *Member* - Indian Science Congress Association
14. Srivastava, Sanjeev Kumar, *Member* - Indian Physical Society
15. Chandra, Amreesh, *Life Member* - Indian Science Congress Association
17. Mathur, Balbir Kumar, *Life member* - MRSI
18. Mathur, Balbir Kumar, *Senior Member* - IEEE
19. Sharma, Shivcharan Lal, *Life Member* - Indian Physical Society
21. Sharma, Shivcharan Lal, *Life Member* - Acoustical Society of India
22. Sharma, Shivcharan Lal, *Life Member* - Materials Research Society of India
24. Sharma, Shivcharan Lal, *Life Member* - Nuclear Track Society of India
25. Sharma, Shivcharan Lal, *Life Member* - Indian Physics Association
26. Ray, Samit Kumar, *Member* - MRS, USA
27. Ray, Samit Kumar, *Member* - IEEE, USA
28. Bharadwaj, Somnath, *Member* - International Astronomical Union
29. Kar, Sayan, *Secretary, IAGRG Council* - Indian Association for General Relativity and Gravitation

**Member - Editorial Board**

5. Panigrahi, Kamal Lochan (0) *Editorial Board Member: High Energy Physics* - The Scientific World Journal
6. Panigrahi, Kamal Lochan (0) *Editorial Board Member: High Energy Physics* - Dataset Papers in Physics
8. Ray, Samit Kumar (2011) *Member of the Editorial Board* - Nanotrends

**Awards & Honours**
1. Chandra, Amreesh (2013) Best Poster Award, 100th Science Congress (Materials Science Section), Kolkata
2. Chandra, Amreesh (2012) Best Poster Award, ICEP-2012, BHU, Varanasi
5. Shukla, Pragya (2012) Senior Associateship, ICTP, Trieste, Italy

**Sponsored Research Projects**

1. A Detailed Study of the Effect of Gamma Radiation on Structural, Optical and Electrical Properties of Indium Oxide Doped Tellurium Dioxide Thin Films (DAE-BRNS-GOI (Submitted for funding), Rs.36.00 Lakhs)
2. Co-operative Phenomena and Nanosize effect in some Correlated Systems (DAE-BRNS, Rs.18.00 Lakhs)
3. Detection/measurement of low magnetic field through phase modulation of light in optical fiber/ photonic crystal fiber coated with ceramic magnetostri (BRNS, Government of India, Rs.15.65 Lakhs)
4. Development and Characterization of Nanostructured thin films for SiGe Quantum Well Infrared Photodetector (QWIP) and ferroelectric based gas/chemi (DRDO, Rs.201.80 Lakhs)
5. Development of Fluorescent Whole Cell Optical Fibre Biosensor for Heavy Metal Pollutants (DOB, Ministry of Science and Technology, Government of India, Rs.44.00 Lakhs)
6. Development of Real Time Gamma Radiation Dosimeters Employing Thin Films of Different Metal Oxides and Their Mixtures (BRNS-DAE-GOI (SRIC-Code: DRG), Rs.29.64 Lakhs)
7. Development of realtime gamma dosimeters employing thin films of different metal oxides and their mixtures. (BRNS, Rs.36.00 Lakhs)
8. Development of Soft Magnetic Materials from Nano Dispersion of Magnetic Particles for High Frequency Applications (ARMREB (DRDO), Rs.36.56 Lakhs)
9. Generation of tunable mid-infrared coherent radiation in the range of 12.7-17um for strategic spectroscopic application (BRNS, Rs.22.57 Lakhs)
10. Investigation of Electrical-, Magneto-Transport, Extraordinary Hall resistivity, Specific Heat and Magnetic studies in nanostructured CMR Manganites (DST, India (Completed), Rs.128.00 Lakhs)
11. Investigation of electronic properties of heusler alloys for the development of environmentally friendly thermoelectric materials. (Department of Science and Technology, Rs.32.38 Lakhs)
12. MBE growth of strained Si/Ge layers and self-assembled Ge islands for heterostructure MOSFETs and flash memory devices (DST, New Delhi, Rs.161.66 Lakhs)
13. Multifunctional Ceramics and Polymer Composites (ISIRD, SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
14. Nanomaterials for smart energy systems (UKIERI, Rs.16.00 Lakhs)
15. Polymer composites for energy systems (Max Planck Society (Germany), Rs.8.50 Lakhs)
16. Pre-operative programme for Indian participation in the FAIR project at GSI, Darmstadt Germany- Accelerator and Detector-related R&D and protot (DST, Rs.15.00 Lakhs)
17. Proposal for Developing an Advanced Electromagnetic Modeling Platform for Complex, Arbitrary Microstructured Fiber and Designing Inline Active and No (DST, Government of India, Rs.10.80 Lakhs)
18. Realization of Packet-switched Node with optoelectronic and Photonic technologies for ultrabroadband communication systems and networks (Italian Ministry of Education, University and Research, Rs.300.00 Lakhs)
19. Second order cascaded nonlinear optical processes for all-optical photonic devices (DST, Govt. of India, Rs.7.62 Lakhs)
20. Semiclassical Strings in AdS/CFT (Department of Science and Technology, India, Rs.12.50 Lakhs)
21. Si/Ge Nanostructure sensitized hybrid solar cells (DST, Rs.47.45 Lakhs)
22. Structural Phase Transitions in Multiferroic Ceramics (BRNS, BARC, Mumbai, Rs.16.54 Lakhs)
23. Studies on Laser-Optical Fiber-Based Micro-Imaging Techniques in the Analysis of Tissue Structure and Detection of Abnormalities (SRIC, IIT Kharagpur, Rs.5.00 Lakhs)
24. Studies on protein-metal interaction by Raman spectroscopy (Department of Science and Technology, Rs.21.05 Lakhs)  
25. Study of hyperfine structure and isotope shift of isotopes using relativistic highly correlated many-body theory (BRNS, DAE, Rs.17.00 Lakhs)  
26. Theoretical studies on transition metal dichalcogenides (TID) (DST, Rs.15.00 Lakhs)  
27. Theoretical Study of Hyperfine Interaction in Heavy Atoms and Molecules for Quantum Computation and Frequency Standard (IIT-Kharagpur(ISIRD), Rs.3.00 Lakhs)  
28. To strengthen the post-graduate teaching and research facilities in the department (DST, New Delhi, Rs.365.00 Lakhs)  
29. Tuning of structural and electrical properties of semiconductors by high energy ion-irradiation (CSIR, Rs.18.38 Lakhs)  

Consultancy Projects  
1. Development of Admission Modules (IISER Admission Committee, Rs.6.00 Lakhs)  
2. Guest House management System (IIT Kharagpur, Rs.3.00 Lakhs)  
3. Measurement of optical nonlinearity of organic and polymer samples (DMSRDE, DRDO Kanpur, Rs.0.53 Lakhs)  
4. Students Academic Management (IISER Pune, Rs.6.00 Lakhs)  
5. Thin Film Characterization (Various departments & agencies, Rs.0.00 Lakhs)  

Patents (filed / granted)  
1. Solar based mobile charger  

Visits Abroad by Faculty Members  
1. Nath, Tapan Kumar - To Deliver talk and to Chair a session for IUMRS-ICN 2012 (Busan, South Korea for IUMRS-ICN 2012 conference to deliver a talk and to Chair a session, ) 30 min  
2. Chandra, Amreesh - E-MRS Fall Meeting (Univeristy of Warsaw, ) 1 week  
3. Chandra, Amreesh - Collaborative Program (Max Planck Institute for Polymer Research, Germany, ) 1 month  
4. Chandra, Amreesh - IIT-DAAD Faculty exchange program (Technical University, Darmstadt, ) 28 days  
5. Ray, Samit Kumar - To participate in Indo-Finland Workshop on Plasmonics for Photovoltaics (Finland, ) 5 days  
6. Das, Amal Kumar - Research collaboration (JKU University Linz, Austria, ) 26 May to 10 July, 2011  
7. Panigrahi, Kamal Lochan - Research and Collaboration (International Centre for Theoretical Physics, ITALY, ) 6 weeks  
8. Ray, Samit Kumar - India-Taiwan Collaborative project (CGU, Taiwan, ) 6 weeks  
9. Ray, Samit Kumar - To deliver an invited talk at IEEE Nanoelectronics Conference 2013 (Singapore, ) 5 days  
10. Shukla, Pragya - Research Collaboration (Institute of Quantum Computing, Waterloo, Canada, ) 1 month  

Invited Lectures by Faculty Members  
1. GO and graphene based composites for energy applications by Chandra, Amreesh (Banaras Hindu University)  
2. Nano-oxides for energy applications by Chandra, Amreesh (IIT Kharagpur)  
3. Eddington-inspired Born-Infeld gravity by Kar, Sayan (International Workshop on New Trends in Field Theories at BHU, Varanasi)  
4. The Planck scale by Kar, Sayan (Scottish Church College, Kolkata)  
5. The Planck scale by Kar, Sayan (Midnapore College, Midnapore)  
6. Eddington-inspired Born-Infeld gravity: new solutions by Kar, Sayan (27th IAGRG Meeting, HNBG University, Srinagar, Garhwal)
7. What is Science? (in Bangla) by Kar, Sayan (JBNSTS Programme at Atulmoni High School, Kharagpur)
8. Search for octupole correlation in nuclei of mass 120 region by Singh, Ajay Kumar (Tata Institute of Fundamental research, Mumbai)
10. Technology and Understanding Phase Modulated Fiber Optic Sensors by Roy Chaudhuri, Partha (NIT, Warangal, Andra Pradesh)
11. MicroRaman Spectroscopy: An Analytical Tool to Study Iron and Steel by Roy, Anushree (Tata Steel, Jamshedpur)
12. PHYSICS OF VISIBLE AND NIR SPECTROSCOPY by Roy, Anushree (AGFE, IIT Kharagpur)
13. Investigating electron correlations using swift heavy ions: A nuclear solid state physics study by Srivastava, Sanjeev Kumar (University of Hyderabad)
14. Swift heavy ion induced nano dimensional phase separation in liquid immiscible metal binary Mn-Bi by Srivastava, Sanjeev Kumar (Indian Science Congress, Kolkata)
15. Atomic scale investigation of solids using heavy ions. by Srivastava, Sanjeev Kumar (ISJPS 2013 IIT Kharagpur)
17. Nanstructured Magnetic Materials by Nath, Tapan Kumar (Nagpur University)
18. Magnetic Nanoparticles: Physics and applications by Nath, Tapan Kumar (NIT Hamirpur)
19. Temperature dependent Spin Injection Properties of the Ni Nanodots Embedded Metallic TiN Matrix by Nath, Tapan Kumar (Busan, South Korea (IUMRS-ICA 2012))
20. Magnetic Materials: Physics & Applications by Nath, Tapan Kumar (Vidysagar University)
21. Weak Measurements: Typical weak and superweak Values by Shukla, Pragya (Institute of Quantum Computing, Waterloo, Canada)
22. Seeing the Universe with Redshifted 21-cm Radiation by Bharadwaj, Somnath (Department of Physics, IISc, Bangalore)
23. Cosmology by Bharadwaj, Somnath (Midnapore College)
24. Modern Science and Swami Vivekananda by Bharadwaj, Somnath (Vivekananda Centenary College, Rahara)
25. Metal Oxides - New Materials for Detection of Ionizing Radiation by Sharma, Shivcharan Lal (UGC DAE Consortium for Scientific Research, Kolkata Centre)
26. Semiclassical String in AdS4 x CP3 by Panigrahi, Kamal Lochan (Scuola Normale Superiore, Pisa)
27. Plenary Talk, National Laser Symposium - Silicon Based Optical Sources: Status & Trends by Ray, Samit Kumar (BARC, Mumbai)
28. Si/Ge Nanowires and Radial Heterostructures for Photonic Devices by Ray, Samit Kumar (Singapore)
29. Group-IV Nanostuctures and Hybrid Photovoltaic Devices by Ray, Samit Kumar (VTT, Finland)
30. Nanostructured and Hybrid Devices for Green Energy by Ray, Samit Kumar (100th Science Congress, Kolkata)
31. Nanocrystal Based Floating Gate Memory Devices by Ray, Samit Kumar (IIT Bombay)
32. Semiconductor Nanowires for Electronic and Photonic Devices by Ray, Samit Kumar (IIT Indore)
33. Nanostructured and Hybrid Photovoltaic devices by Ray, Samit Kumar (Kolkata)
34. Quantum Devices using Semiconductor Nanostructures by Ray, Samit Kumar (Quantum-Nano Winter School, Agra)
35. Rayleigh-Benard convection in low-Prandtl-number fluids by Kumar, Krishna (National Institute of Technology, Durgapur)

Books Published


Papers Published in Journals
1. A Griffiths-like phase in antiferromagnetic R0.5Eu0.5MnO3 (R = Pr, Nd, Sm), By A Karmakar, S Majumdar, S Kundu, T. K. Nath and S Giri, J. Phys.: Condens. Matter 25, 066006 (2012)


14. Critical behavior and magnetic relaxation dynamics of Nd0.4Sr0.6MnO3 nanoparticles By S. Kundu and T. K. Nath, Philosophical Magazine, DOI:10.1080/14786435.2013.776719 (2013)


18. Effect of Mn doping on magnetic and transport properties of Nd0.5Sr0.5Co1-yMnyO3 (y = 0, 0.1, 0.3, 0.9, 0.95 and 1), By S. Kundu and T. K. Nath, Journal of Magnetism and Magnetic Materials, 325 1–6, (2013)


21. Evidence of glassy ferromagnetic phase and kinetic arrest of electronic phase in Sm0.35Pr0.15Sr0.5MnO3 manganites, By S. K. Giri and T. K. Nath *Journal of Magnetism and Magnetic Materials* 324, 2277 (2012)


25. Field-induced magnetic phase transition in Pr3+ doped Sm0.5Sr0.5MnO3 manganites, By S. K. Giri and T. K. Nath *Journal of Applied Physics*, 113, 17D706 (2013)


30. Magnetolectric response and Dielectric property of Multiferroic Co0.65Zn0.35Fe2O4 - PbZr0.52Ti0.48O3 Nanocomposites, By P. R. Mandal and T. K. Nath, *Applied Physics A* (in press) (2013)
43. Metallicity and ferromagnetism in nanosystem of charge ordered Nd0.5Sr0.5MnO3,  By S. Kundu, T. K. Nath, A. K. Nigam, T. Maltra and A. Taraphder, *J. Nanoscience and Nanotechnology* 12, 943-949 (2013)
45. Observation of Griffiths Phase in antiferromagnetic La0.32Eu0.68MnO3,  By A Karmakar, S. Majumdar, S. Kundu, T. K. Nath and S. Giri *Journal of Physics: Condensed Matter* 24, 126003 (2012)
46. On Rotating and Oscillating Four-Spin Strings in AdS(5) x S**5  By Kamal L. Panigrahi and P. M. Pradhan *Journal of High Energy Physics* 1211, 053 (2012)
56. Raman sensitivity to crystal structure in InAs nanowires  By Jaya Kumar Panda, Anushree Roy, Achintya Singha, Mauro Gemmi, Daniele Ercolani, Vittorio Pellegrini, and Lucia Sorba *Appl. Phys. Letts* 100, 143101 (2012)
60. Sign reversal of junction magnetoresistance in p-La0.7Ca0.3MnO3/SiO2/n-Si heterostructure: A possibility in spintronics application  By S. K. Giri and T. K. Nath, *Journal of Nanoscience and Nanotechnology* 12, 7822 (2012)


66. Superparamagnetic state by Linear and Non-Linear AC Magnetic Susceptibility in Mn0.5Zn0.5Fe2O4 Ferrites Nanoparticles, By T. Suneetha, S. Kundu, Subhash C. Kashyap, H. C. Gupta, and T. K. Nath, J. Nanoscience and Nanotechnology, 13, 270 (2013)

67. Suppression of a glassy magnetic state and emergence of a Griffiths-like phase on size reduction in Nd0.8Sr0.2MnO3 , By S. Kundu and T. K. Nath, Journal of Applied Physics 111, 113903 (2012)


Papers Presented in Conferences


10. Ferromagnetism in BiFeO3 nanoceramics, By B. Kumari, P. R. Mandal and T. K. Nath, *Proceedings of ISJPS 2013, page 136 (2013)*, held in IIT Kharagpur,


14. Investigation of magnetic and electrical properties of multiferroic Ni0.35Co0.30Zn0.35Fe2O4 – PbZr0.52Ti0.48O3 Nanocomposites, By P. R. Mandal and T. K. Nath, *Procedures of XVII NFSD-2012, page 129 (2012)*, ITER, Hubsanweswar, (2012)


28. Search for Shears Mechanism in 142Sm, By S. Rajbanshi, A. Bisoi, S. Nag, S. Saha, J. Sethi, T. Trivedi, T. Bhattacharjee, S. Bhattacharyya, S. Chattopadhyay, G. Gangopadhyay,


32. Spin reorientation and magnetodielectric effect in Gd-substituted YFe0.6Mn0.4O3., By P. R. Mandal and T. K. Nath, Proceedings of ISJPS 2013, page 134 (2013), held in IIT Kharagpur, (2013)


37. Temperature dependent giant positive Magnetoresistance in Co0.65Zn0.35Fe2O4/p-Si heterostructure magnetic Diode for Spintronics, By J. Panda and T. K. Nath, Proceedings of ISJPS 2013, page 144 (2013), held in IIT KGP, (2013)


Centre for Educational Technology

**Head**
Prof. Bani Bhattacharya

**Professor**
Ray, Anup Kumar

**Associate Professor**
Bhattacharya, Bani
*Ph.D.(IIT Kharagpur), Instructional Design Distance Education Technology Enhanced Learning Pedagogical Research*

**Assistant Professors**
Bhowmick, Plaban Kumar
*Ph.D.(IIT Kharagpur),*
Das Mandal, Shyamal Kumar
*Ph.D.(Jadavpur Univ), Speech and Signal Processing*
Mohanty, Atasi
*Ph.D.(Utkal University), Cognitive Psychology Human Resource Development Health & Counselling Psychology*

**Visiting Faculty**
Prof. A.K. Ray
*Ph.D Educational Technology; Video Systems Engg*

**New Academic Programmes**
M.Tech in Media and Sound Engineering

**Brief Description of on-going activities**

CET, IIT Kharagpur is offering an M.Tech Programme on “Media and Sound Engineering”. Students with B.Tech./B.E. or equivalent qualification in CSE/ECE/EE/Instrumentation Engineering /IT are eligible to apply. CET also offers Ph.D and M.S. programmes in both, areas related to educational pedagogy and in Speech and Image processing. Research scholars are already working in these areas. Ten research scholars are already working in the area of Educational Technology and Speech Processing. M.Tech programme for teachers of AICTE affiliated institutions and industry are being offered through videoconferencing mode at 3 studios in CET.

Ongoing Sponsored Projects : 1) National Program on Technology Enhanced Learning - CET, IIT Kharagpur has already developed 186 courses (7,440 hours of video courses) as a part of NPTEL phase I & II which are available in the LAN for internal feedback. CET is planning to develop more courses by March 2013. 2) Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning. 90 courses have been completed in the pilot phase and 20 more are to be completed by March 2013. These courses consist detailed curriculum documents for each course with instructional objectives, assessment and references to learning resource materials. 3) Creation of Integrated Development Environment (IDE) for Generation of Pronunciation Lexicon for Indian Languages (PL-IL) in W3C Pronunciation Lexicon Standard (PLS) and Example lexicon in Hindi and Bangla Languages.

**Thrust Areas**

1. The center has produced nearly 4,800 hours of video courses in various engineering subjects. These are in use in more than 250 engineering colleges, universities and R & D laboratories. These courses are primarily used for self-learning by faculty, staff and students. Significant demand for them exists in overseas markets also. CD & DVD versions of these courses are
available. CET is now also making the courses available on HDDs – to be used in the Video-on-Demand (VOD) mode by institutions within their internal LAN. This allows access to any course on the LAN to a large number of users at any point of time along with the ability to control all normal play functions at will. More than 3700 users access these courses on any single day within the LAN of IIT Kharagpur.

2. Instructional Design; Technology Enhanced Learning; Teaching-Learning Process; Distance Education; Speech and Image processing Speech Technology development for Indian Language and ICT application Cognitive Psychology & Human Resource Development E-learning

New Acquisitions

1. CET connected 15 locations though Video Conferencing both in IIT-Kharagpur and in extension centers in Kolkata and Bhubaneswar. The main purpose of the same is to run part time M Tech programs in Electronics & Communication Engineering and Electrical Engineering for AICTEE recognized college teachers. It is also used for conducting various meetings, overseas interviews etc. The project cost around 270.00 lacs for various equipments and studio upgradation. 20 or more manpower has been trained to operate the system to provide support for the same.

2. The video studios are being updated to HD (High definition) system and as a result new set of instruments like camera, switcher etc are being installed.

3. Establishment of Video Systems Laboratory at CET: A state-of-the-art video systems laboratory has been set up with purchase of audio / video equipment worth Rs. 80 lakhs. Centre also creating the largest active video lecture storage system of 400TB.

International Collaborations

Centre has collaborated with University of Tokyo Japan and also submitted collaborative project in the area of speech processing. Prof. B. Bhattacharya and Prof. S. K. Das Mandal Visited University of Tokyo, Japan during June, 2012.

Lectures by Visiting Experts

1. Prosody Modelling by Prof. Hiroya Fujisaki (Emeritus Prof. University of Tokyo)
2. Speech Signal Processing by Prof. Henning Reetz (Univ of Frankfurt, Germany)
3. Educational Technology by Prof. Raj Reddy (Carnegie Mellon University, USA)
4. Speech Prosody by Prof. Keikechi Hiroshi (Prof. Univ of Tokyo)

Doctoral and MS Degrees Awarded


Member - Professional Bodies

1. Mohanty, Atasi, Life Member- No.1232 - Indian Academy of Applied Psychology
2. Mohanty, Atasi, Life Member - Indian Association of Health Research & Welfare
3. Mohanty, Atasi, Regular Member up to 2016 - National Academy of Psychology
4. Das Mandal, Shyamal Kumar, Member - International Speech Communication Association
5. Bhattacharya, Bani, Associate - Board of experts in E-Learning Forum and Distance Education, Commonwealth of Learning
8. Bhattacharya, Bani, Member - Technical Programme Committee, T4E, IEEE Chennai
9. Bhattacharya, Bani, Regular - International Forum of Educational Technology and Society
10. Bhattacharya, Bani, member - Technical Programme Committee, T4E, IEEE Hyderabad
Member - Editorial Board

3. Bhattacharya, Bani (0) *Member and Reviewer* - IEEE Techsym
5. Bhattacharya, Bani (2013) *Committee Member* - The 7th European Conference on Games Based Learning (ECGBL13)

Sponsored Research Projects

1. A Multi-modal and ICT based Intervention Programme for removing Specific Learning Difficulties among Children (Indian Council of Social Science Research- MHRD India, Rs.0.00 Lakhs)
2. Creation of IDE for Generation of Pronunciation Lexicon for Indian Languages (PL-IL) in W3C Pronunciation Lexicon Standard (PLS) and Example lexicon i (Department of Information Technology, Rs.47.26 Lakhs)
3. Creation of Integrated Development Environment (IDE) for Generation of Pronunciation Lexicon for Indian Languages (PL-IL) in W3C Pronunciation Lexicon (DIT, Rs.47.00 Lakhs)
4. Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning (MHRD, Rs.100.00 Lakhs)
5. Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning ICE - main phase (MHRD, Rs.1600.00 Lakhs)
6. NPTEL (MHRD, Rs.1133.00 Lakhs)

Visits Abroad by Faculty Members

1. Das Mandal, Shyamal Kumar - Present Paper (Macau, China, ) December 9-12, 2012
2. Das Mandal, Shyamal Kumar - Invitation for Talk (University of Tokyo, Japan, ) 2-9, June2012
3. Bhattacharya, Bani - Collaboration Project (Tokyo University, Japan, ) 5 days
4. Bhattacharya, Bani - Conference (Athens, Greece, ) 5 days
5. Das Mandal, Shyamal Kumar - Present paper in Interspeech 2011 (Florence,Italy, ) 4 days

Invited Lectures by Faculty Members

1. Business Communication- EMBA Course by Mohanty, Atasi (IIT Kgp- Extension Centre- Bhubaneswar)
2. Speech Prosody and its Modeling for Speech Technology by Das Mandal, Shyamal Kumar (FRSM-2013, Jadavpur University)
3. Pedagoical Principles by Bhattacharya, Bani (Assam Engineering College, Guwhati)
4. NMEICT Projects by Bhattacharya, Bani (Vidyasagar University)

Short-Term Courses, Training Programmes and Workshops organised

1. Educational Leadership (19-25 September, 2011)

Papers Published in Journals

1. Charisma as a factor in good teaching By Bhattacharya, B. Vasisth *Staff and Educational Development International* Volume 15, Number 3, (2012)
2. Collaborative Learning in Distance Education: A Case Study By Bhattacharya, B. *Online Journal of Education Research*, Volume 1, Issue 1, p (2012)


**Papers Presented in Conferences**


Centre for Oceans, Rivers, Atmosphere and Land Sciences

Head
Prof. Debabrata Sen

Associate Professor
Chakraborty, Arun  Ph.D (IIT Delhi), Ocean Dynamics and Ocean Circulation Modeling of the Bay of Bengal, Data Assimilation

Assistant Professors
Behera, Mukunda Dev  Ph.D.(IIRS, DehraDun), Land/ Vegetation Cover and River Basin Dynamics, Biodiversity and Geoinformatics Modeling, Forest Biomass and Carbon Sequestration, Ecosystem Ecology and Climate

Dash, Mihir Kumar  Ph.D. (Gujarat University), Satellite Oceanography, Mesoscale Ocean Modeling, Cryospheric Studies

Mandal, Manabottam  Ph.D.(IIT Delhi), Observations and modeling of land surface processes, Modeling of extreme weather events - tropical cyclones and thunderstorms, Regional climate modeling, Cloud microphysics, Mesoscale and land surface data assimilation

Satyanarayana, Achanta Naga Venkata  Ph.D (BHU), Observations and Modeling of PBL dynamics and Thunderstorms, Parameterization of Land Surface Processes, Air-Sea Interactions

Shaji, C  Ph.D. (IIT Delhi), Ocean Modeling and Analysis, Coastal Processes, Monsoon Oceanography

New Academic Programmes

Launching a Programme in the area of Marine Resource development and Management (in pipe line)

Brief Description of on-going activities

The CORAL center is actively participating in DST/MOES sponsored STORM (Severe Thunderstorms and Regional Modeling) which is in operation along East/North East part of India. Under this program a 50 m instrumented micro-meteorological tower was installed in IIT Kharagpur campus to monitor the atmospheric surface layer characteristics during the pre-monsoon thunderstorm activity. A state of art upper air sounding system was procured to study the atmospheric boundary layer dynamics during various epochs of thunderstorm activities at Kharagpur. These systems are actively used in STORM programme as well as CTCZ experimental programme. The centre is also involved in the development of Data Assimilative Coastal Circulation Model Over Bay of Bengal; development of a Hybrid Coordinate Ocean Model (HYCOM) for the Bay of Bengal, numerical simulation of Bay-of-Bengal Circulation Features using satellite data; air-sea interaction studies, sea ice monitoring using remote sensing and satellite data obtained from Megha-Tropiques and to study any climate signal in their variation. Attempts are also underway in biodiversity characterization at landscape level using Satellite Remote Sensing and GIS for various states of India as well as Land Use and Land Cover change Dynamics. Moreover, studies involving assessment and modelling of Forest Biomass and Carbon Dynamics using Remote Sensing and GIS is on going.

Thrust Areas

1. Observations and modeling of atmosphere and oceans
2. Climate variation studies towards Climate Change
Lectures by Visiting Experts

1. Why Indian Ocean is different from Other world Ocean - 10 January 2011 by Dr Prasanna Kumar (Deputy Director, National Institute of Oceanography, Goa)
2. Observing System Simulation Experiment for NASA Global Precipitation Mission using FSU Model - 7 January 2011 by Dr Akhilesh Mishra (Research Associate, Florida State University, USA)
3. Climate Change in East Asia - 9 February 2011 by Dr Sahana Paul (Post doctoral Research Associate, National Taiwan University, Taiwan)
4. Development and application of ground-based, mobile scanning lidars for 3-D measurements of aerosol, temp & moisture distributions in ABL - 28 July 2010 by Dr Sandip Pal (Post Doctoral Fellow, Institute of Physics and Meteorology, University of Hehenheim, Germany)

Member - Professional Bodies

1. Mandal, Manabottam, Member - Asia Oceania Geophysical Society
2. Mandal, Manabottam, Life Member - Indian Meteorological Society
3. Satyanarayana, Achanta Naga Venkata, Member - International Association of Urban Climate (IAUC), USA
4. Satyanarayana, Achanta Naga Venkata, Life Member - India Meteorological Society, New Delhi
5. Dash, Mihir Kumar, Member - American Geo-physical Union
6. Chakraborty, Arun, Life Member - Indian Geophysical Union
7. Chakraborty, Arun, Life member - Ocean Society of India
8. Chakraborty, Arun, Life Member - Indian Meteorological Society
9. Chakraborty, Arun, Life Member - The Indian Science Congress Association
10. Behera, Mukunda Dev, Member - International Association of Vegetation Science
11. Behera, Mukunda Dev, Life Member - National Institute of Ecology
12. Behera, Mukunda Dev, Life Member - Indian Association of Angiosperm taxonomy
13. Behera, Mukunda Dev, Annual - International Society for Tropical Ecology
14. Shaji, C, - Life Member: American Geophysical Union, USA
15. Shaji, C, - Life Member: Japan Oceanographic Society, Japan
16. Shaji, C, - Life Member: Indian Society of Theoretical and Applied Mathematics
17. Shaji, C, - Life Member: Ocean Society of India
18. Shaji, C, Life Member - Indian Geophysical Union

Member - Editorial Board

1. Behera, Mukunda Dev (2012) Guest Editor (Special Issue on Climate Change) - Biodiversity and Conservation
2. Behera, Mukunda Dev (2012) Guest Editor (Special Section on Forest Remote Sensing, Biodiversity and Climate) - Current Science
4. Chakraborty, Arun (2011) Associate Editor - Geoscience Research

Awards & Honours

1. Chakraborty, Arun (2013) Adjunct Faculty, IIT Bhubaneswar

Sponsored Research Projects

1. Analysis and simulation of land surface energy balance at a tropical site using INSAT-3D observations (ISRO, Rs.15.30 Lakhs)
2. Assessment and Modelling of Forest Biomass and Carbon Dynamics using Remote Sensing and GIS in Katerniaghat WLS, U.P. (National Botanical Research Institute (NBRI), CSIR, Lucknow, Rs.60.00 Lakhs)
3. Developing Ganga Basin Environment Management Plan-Biodiversity and Ecology Theme (Ministry of Environment and Forests (MOEF), New Delhi, Rs.32.00 Lakhs)
4. Development of a Hybrid Coordinate Ocean Model (HYCOM) for the Bay of Bengal (Indian National Centre for Ocean Information Services (INCOIS), Hyderabad, Rs.0.00 Lakhs)
5. Development of Data Assimilative Coastal Circulation Model Over Bay of Bengal (Completed) (SAC, ISRO, Ahmedabad, Rs.22.80 Lakhs)
6. Development of Operational Ocean model for Bay of Bengal (INCOIS, Hyderabad, Rs.54.00 Lakhs)
7. Evaluation of atmospheric boundary layer parameters for validating atmospheric flow models at Kalpakkam (Board of Research in Nuclear Sciences - Department of Atomic Energy - Indira Gandhi Centre for Atmom, Rs.3.52 Lakhs)
8. Feature based study of Indian Ocean Circulation Using Saral Altika Observations (Indian Space Research Organization, Rs.15.42 Lakhs)
9. High resolution mesoscale prediction of land-falling Bay of Bengal cyclones for coastal disaster preparedness (MoES, Govt. of India, Rs.16.20 Lakhs)
10. Land Use Land Cover Dynamics in Relation to Human Dimensions and climate change in Mahanadi, ganga and Brahmaputra River Basin (Indian Institute of Remote Sensing, ISRO, DehraDun, Rs.41.00 Lakhs)
11. Monitoring of sea ice using oceandat - 2 scatterometer data for determination of climatic trend (Space Applications Centre (ISRO), Ahmedabad, Rs.22.80 Lakhs)
12. Observational & modeling of atmospheric boundary layer over different land surface conditions in the CTCZ domain during different epochs of Indian monsoon (MoES, Rs.31.20 Lakhs)
13. Regional assimilation of land surface parameters over Indian landmass for providing surface boundary condition to numerical models for simulation of M (MoES, Rs.64.92 Lakhs)
14. Sea ice monitoring in the Arctic and the Antractic (National Centre for Antarctic and Ocean Research (MOES), Goa, Rs.45.00 Lakhs)
15. Simulation of Bay-of-Bengal Circulation Features using OCEANSAT-II Scatterometer Wind and OCM (Completed) (SAC, ISRO, Ahmedabad, Rs.17.40 Lakhs)
16. Smarter water resource management, Disaster Mitigation and Diabetic retinopathy (IBM, Rs.17.60 Lakhs)
17. South Asian Precipitation A: Seamless Assessment (SAPRIS) (MoEs and UK, Rs.53.00 Lakhs)
18. Study of the behaviour of Oil Spill on Ocean surface through laboratory experiments, modeling and Satelite Images (MOES, Govt. of India, Rs.78.00 Lakhs)
19. Study of the Behaviour of Oil Spill on Ocean Surface Through Laboratory Experiments, Modelling and Satelite Images (Ministry of Earth Sciences, Rs.0.00 Lakhs)
20. Study of the surface and upper ocean Mesoscale features of North Indian Ocean from observation and Model (Ministry of Earth Sciences Through OASTC cell, IIT Kharagpur, Rs.31.36 Lakhs)

Visits Abroad by Faculty Members

1. Behera, Mukunda Dev - To attend International Conference (Birmingham, ) September 2011
3. Behera, Mukunda Dev - Research Discussion (University of Liebeig, Hannover, ) September 2011
4. Chakraborty, Arun - Scientific Research and Collaboration (University of Massachussetts, Dartmouth, USA, ) (June - July, 2012, 39 days)
5. Behera, Mukunda Dev - Conference (Kathmandu Nepal, ) 29-31 May 2012

Invited Lectures by Faculty Members

1. Modeling of SW Monsoon Induced Synoptic Features along India’s West Coast by Shaji, C (University of Pune)
2. Global Warming by Chakraborty, Arun (Garbeta High School)
Papers Published in Journals

1. Characterizing Shorea robusta communities in the part of Indian Terai landscape By Chitale VS, Behera MD, Matin S, Roy PS, Sinha VK Journal of Forestry Research (Accepted) (0)


4. Estimation of Indian coastal areas inundated into the sea due to sea level rise during the 20th century By S. Nayak, M. Mandal, A. Adhikari and R. Bhatla Current Science 104, 5, 583-585 (2013)

5. Impact of Land Use and Land Cover changes on temperature trends over Western India By S. Nayak and M. Mandal Current Science 102, 8, 1166-1173 (2012)


7. Modeling contribution of wildfires in predicting distribution of four endemic tree species in part of Himalayan biodiversity hotspot By Chitale VS and Behera MD. Ecological Engineering (2013)


9. Movement of seasonal eddies and its relation with cyclonic heat potential and cyclogenesis points in the Bay of Bengal By Bishnu Kumar and Arun Chakraborty Natural Hazards 1-19 (2011)


14. Terrestrial Carbon Studies and Earth Observation Data By MD Behera and Dash J Current Science 104 (4) 413 (2013)

15. The analysis of 20°C and 26°C isotherm variability over Bay of Bengal By Tarumay Ghoshal, Sourav Sil and Arun Chakraborty J Ecosyst Ecolgr 2-4 (2012)


Papers Presented in Conferences


4. Implication of Empirical Orthogonal Function Analysis to Objectively Analyzed Ocean Temperature Data of Bay of Bengal, By Tarumay Ghoshal, Sudip Jana and Arun Chakraborty, OSICON 2011, NIOT, CHENNAI, CHENNAI, INDIA, (2011)


12. The analysis of 20ºc and 26ºc isotherm variability over Bay of Bengal, By Tarumay Ghoshal, Sourav Sil and Arun Chakraborty, Biodiversity 2012, International Conference by OMICS group at Hyderabad, Hyderabad, India, (2012)

Cryogenic Engineering Centre

**Head**

Prof. Kanchan Chowdhury  from  01.01.2013

**Professors**

Bandyopadhyay, Syamalendu Sekhar  
*Ph.D. (IIT Kharagpur)*, Natural gas processing, Carbon dioxide capture and sequestration, Air breathing propulsion, Separation processes

Chowdhury, Kanchan  

Dey, Tapas Kumar  
*Ph.D. (Delhi Univ)*, Polymer Nanocomposites, Nanofluids and its applications, Magnesium Di-boride Superconductors

Rao, Vutukuru Vasudeva  
*Ph.D. (IIT Madras)*, Vacuum Technology, Cryo Physics, Applied Superconductivity

Sarangi, Sunil Kumar  
*Ph.D. (Stony Brook)*,

**Assistant Professors**

Adyam, Venimadhav  
*Ph.D. (IISc. Bangalore)*, Multiferroics Spintronics Thermoelectrics Nanomaterials and Thin film batteries

Ghosh, Indranil  

Ghosh, Parthasarathi  
*Ph.D. (IIT Kharagpur)*, Low Temperature Processes and equipment, Cryogenic turboexpander and expansion devices, Helium Refrigeration and liquefaction systems, Cryogenic storage and transfer, Thermodynamics and heat transfer of supercritical helium

Nandi, Tapas Kumar  
*Ph.D. (IIT Kharagpur)*, Perforated plate matrix heat exchanger, Cryogenic wave expander, Cryogenic rocket propulsion

Sandilya, Pavitra  
*Ph.D. (IIT Kanpur)*, Gas hydrates, Cryogenic transport Phenomena-based processes, CO2 capture and sequestration, Space cooling

**Faculty Appointments**

Bandyopadhyay, Syamalendu Sekhar  
Visiting Professor

**Faculty Retirement**

Bandyopadhyay, Syamalendu Sekhar  
Professor

**Brief Description of on-going activities**

Cryogenic Engineering Centre is engaged in teaching at UG and PG levels, sponsored research and consultancy remain at the core activity of the Centre.

The Centre is also active in Continuing Education through training engineers from industries, faculty from academic institutions, and scientists from R&D organisations by conducting short term courses and workshops in specialised areas like Cryogenic Engineering, Air Seapartio, Vacuum Technology etc.

**Thrust Areas**
1. Cryogenic Engineering
2. Advanced Materials
3. Nonconventional Energy

**Doctoral and MS Degrees Awarded**

1. Rijo Jacob Thomas : Exergy Approach in Designing Large-Scale Helium Liquefier(Ph.D.)
3. Pattabhi Vishnuvardhan G : Development of an algorithm to analyse the conceptual design of three dimensional multi stage cabling scheme for cable in conduit conductor (CICC)(MS)

**Member - Professional Bodies**

1. Sandilya, Pavitra, *Life Member* - Indian Cryogenic council
2. Nandi, Tapas Kumar, *Life Member* - Indian Society for Technical Education (ISTE)
3. Nandi, Tapas Kumar, *Life Member* - Indian Cryogenics Council
5. Ghosh, Parthasarathi, *Regular* - Indian Cryogenic Council
7. Adyam, Venimadhav, *Permanent* - Magnetic Society of India
8. Dey, Tapas Kumar, *International Scientific Committee Member* - Asian Thermophysical Society
9. Dey, Tapas Kumar, *Regular (life Member)* - Indian Cryogenic Council
10. Dey, Tapas Kumar, *Fellow (life member)* - Thermophysical Society of India
11. Dey, Tapas Kumar, *Regular (Life Member)* - Materials Research Society of India
14. Chowdhury, Kanchan, *Member* - Indian Institute of Chemical Engineers
15. Bandyopadhyay, Syamalendu Sekhar, *Life Member* - Indian Institute of Chemical Engineers

**Member - Editorial Board**

1. Dey, Tapas Kumar (2011) *Member* - Indian Journal of Cryogenics

**Awards & Honours**

1. Bandyopadhyay, Syamalendu Sekhar (2012) *Member, Programme Advisory and Monitoring Committee (PAMC)* of NPCSR of DST

**Sponsored Research Projects**

1. A bridge project aimed at the expansion of Lithium ion battery research (SRIC, Rs.5.00 Lakhs)
2. Analysis & Development of Conceptual Design Methodologies for Air Collection and Enrichment System of Air Breathing Propulsion-Phase II ( ISRO, Rs.20.00 Lakhs)
3. Design, Fabrication and Testing of Miniature Heat Exchangers and Heat Sinks (ON-GOING) (CSIR, New Delhi, Rs.10.61 Lakhs)
4. Fabrication of oxide multiferroic thin films by RF Magnetron Sputtering: Investigation of magnetodielectric and magnetoferroelectric properties (DST, Rs.17.00 Lakhs)
5. Investigation of the effects of tribocharging of solid particles on possible ignitions in gaseous oxygen systems: Experiments and Analyses (Department of Science and Technology, New Delhi, Rs.30.00 Lakhs)
6. Investigation on polymer nanocomposite for electronic packaging applications (CSIR, New Delhi, Rs.10.76 Lakhs)
7. Radiation Heat Transfer in Open Cell Metal Foam - An Experimental Study (ON-GOING) (CSIR, New Delhi, Rs.18.42 Lakhs)
8. Studies on novel Heusler alloys for the development of environmentally friendly thermoelectric materials (DST, Rs.34.00 Lakhs)
9. Synthesis and multiferroic properties of $\text{AF}_2\text{O}_3$ nanoparticles (A= Ba, Sr) for space applications (CSIR, Rs.18.00 Lakhs)
10. Thermal and Mechanical Properties of Polymer Nanocomposites and Agro-fiber based Biocomposites (Department of Science & Technology, Govt. of India, Rs.40.00 Lakhs)

**Consultancy Projects**

1. Characterization of cryochamber and soaking chamber (STNIL Cryogenics, Rs.1.00 Lakhs)
2. Conceptual Design of a Novel Method for Extraction of Methane Gas from Submarine Gas Hydrate by Seabed Heating (KDMIPE (ONGC), Rs.50.24 Lakhs)
3. Design and development of superconducting fault current limiters and vacuum technology (Completed) (Crompton Greaves Ltd, Rs.30.00 Lakhs)
4. Design of Support Structure for Cryogenic HTS Coil of HTSC Motor (BHEL, Rs.11.85 Lakhs)
5. Development of Gas Sweetening Technology for Removal of CO2 from Natural Gas and Industrial Gas Streams by Using Blended/Activated Amine Solvents (Engineers India Limited (EIL)), Rs.30.00 Lakhs
6. Experimental setup for Cryogenic condition for Aerospace applications (Completed) (CIPET Bhubaneswar, Rs.1.50 Lakhs)
7. Measurement of coefficient of thermal expansion of AA2219, SS321 & 07x16 H6 alloys between 77 and 300K (LPSC, ISRO, Trivandrum, Rs.2.50 Lakhs)
8. Measurement of CTE of 10 samples of polymer rods at cryogenic temperatures (300 - 80K) (Vikram Sarabhai Space Centre (VSSC) Thiruvananthapuram, Rs.2.80 Lakhs)

**Visits Abroad by Faculty Members**

2. Ghosh, Parthasarathi - Attending IIR conference Cryogenics 2012 (Dresden Germany, 11th - 14th September 2012)
3. Ghosh, Parthasarathi - Invited for technical discussion with Prof. H Neumann at Karlsruhe Institute of Technology (Karlsruhe Germany, 15th -18th September 2012)
4. Bandyopadhyay, Syamalendu Sekhar - To participate in ICFEE-2013, Visit the Chemical Engineering Dept. of Univ. of Rome, La Sapienza (Rome, Italy, 23-28 February 2013)
5. Chowdhury, Kanchan - Guest Scientist (Physikalisch-Technische Bundesanstalt Braunschweig Germany, 2 months (May-July, 2011))

**Invited Lectures by Faculty Members**

1. Multiglass behavior in La2NiMnO6 nanoparticles by Adyam, Venimadhav (MagMa-2012, IIT Madras, 2012)
2. Cryogenic Separation Processes by Bandyopadhyay, Syamalendu Sekhar (Haldia Institute of Technology)
3. Enhanced Heat Conduction of Nanofluids and its Application in Thermal Management of Modern Electroni by Dey, Tapas Kumar (Kakatiya University, Warangal)
4. Enhanced heat conduction of nanofluids & its applications in thermal management of high power electr by Dey, Tapas Kumar (Don Bosco College of Engineering & Technology, Assam)
5. High Tc Superconductors for Power Applications by Rao, Vutukuru Vasudeva (Institute for Plasma Research, Bhat, Gandhinagar)
6. VSM & SQUID Magnetometers by Rao, Vutukuru Vasudeva (S.V.University, Tirupati)
7. Superconducting Power Grid by Rao, Vutukuru Vasudeva (NIT Rourkela)
8. Superconducting Power Grid - Cryogenic Issues by Rao, Vutukuru Vasudeva (VECC, Kolkata)
**Short-Term Courses, Training Programmes and Workshops organised**

1. Cryogenic Air Separation and Oxygen Safety-2012 (6 days)
2. Two Week Short Term Course on Vacuum Technology and Process Applications (01st Nov. – 10th Nov. 2012)

**Papers Published in Journals**

5. Dynamic simulation of large-scale helium liquefier using Aspen Hysys®: Problems, solutions and prospect. By • Rohan Dutta, Rijo J Thomas, Parthasarathi Ghosh, and Kanchan Chowdhury *Indian Journal of Cryogenics* Accepted (0)
10. Influence of mass flow rate on turbulent kinetic energy (TKE) distribution in cable-in-conduit conductors (CICC) used for fusion grade magnets. By D. Raja Sekhar, V.V.Rao *Fusion Engineering and design* (In Press) 00 (2013)


27. Three Dimensional CFD Analysis of Cable-in-Conduit Conductors (CICC) using Porous Medium Approach  By D. Raja Sekhar, V.V.Rao  *Cryogenics* 54, 20-29 (2013)

**Papers Presented in Conferences**


11. Influence of Aluminium Nitride (nano) on the superconducting properties of MgB2, By D K Tripathi & T K Dey, Nat. Conf. on Advances in Materials Science & Technologies, Kakatiya University, Warangal, (2012)

12. Many hospital fires are due to oxygen enrichment: need for redesigning ventilation system, air conditioner and arrangement of intensive care units., By Shekhar Gaikwad, Kanchan Chowdhury, 24th National Symposium on Cryogenics, Institute for Plasma Research, Gandhinag, (2013)


18. Probing of phase separation dynamics in Pr0.6Ca0.4MnO3 using dielectric spectroscopy, By K Devi Chandrasekhar, A K Das and A Venimadhav, Novel Materials: Adding materialspecific reality in physicists models, Natal, Brazil, (2012)

19. PROCESS INTENSIFICATION OF AIR SEPARATION USING CENTRIFUGAL FIELD, By P Sandilya, Rajan Kumar, Ramendra Kumar Sahu, National Symposium on Cryogenics, Ahmedabad, (2013)

20. Proposed experiments for tribocharging of dust particles and possible ignition upon discharge in oxygen environment., By Debanjana Bhattacharyya, Kanchan Chowdhury, 24th National Symposium on Cryogenics, Institute for Plasma Research, Gandhinag, (2013)

Materials Science Centre

Head
Prof. Shanker Ram

Professors
Adhikari, Basudam  
Ph.D. (Calcutta Univ), Development of jute based fully biodegradable green composites, Development of jute-cement concrete composites, Development of jute based geotextiles, Development of jute based sound proofing panels, Development of a suitable processing technique for rubber coating of jute, Development of conducting polymer based gas sensors, Polymer based drug delivery systems, Development of volatile compound based biosensor for pest control, Development of polymer based taste sensor, Collagen and chitosan based scaffold for tissue engineering, Development of jute based baby diaper materials, Development of jute based fully biodegradable green composite

Banerjee, Susanta  
Ph.D. (IIT Kharagpur), Fluorinated High performance polymers, Membrane based separation, Hyperbranched polymers, Light emitting polymers, Polymer synthesis and characterization

Bhattacharya, Debasis  
Ph.D. (Calcutta Univ), Synthesis and processing of meso porous ceramics for catalytic applications, nano HAP for biomedical applications, Thin film ceramics for memory applications

Das, Chapal Kumar  
Ph.D. (IIT Kharagpur), Nanocomposites, Direct fluorination, In situ Nanocomposites for supercapacitor Application, Polymer Blends and its compatibilization, In situ Nanocomposites for Microwave absorbing Materials, Graphene Based Nanocomposites, Organic Inorganic Hybrid Nanocomposites

Ram, Shanker  
Ph.D. (BHU, Varanasi), Glasses and disordered solids, Alloys and intermetallics, Nanoceramics and hybrid composites, Magnetics and magnetocaloric materials, Ferroics and applications, Porous materials and applications, Metallic foams for biological applications, Nanofluids and nanoglues, Films, Optical materials and applications, Biomaterials, Phase transformations and phase transitions, Photonics

Associate Professors
Banerji, Pallab  
Ph.D. (Jadavpur Univ), Low dimensional semiconductors for photovoltaic & thermoelectric applications

Jacob, Chacko  
Ph.D. (Case Western, USA), Materials Science/ Nanomaterials and Nanotechnology/Semiconductors

Majumder, Subhasish Basu  
Ph.D. (IIT Kanpur), Oxide gas sensors, Lithium rechargeable batteries, Natural fiber reinforced cement composites, Fly ash based ceramic products, Multiferroic thin films and composites

Assistant Professors
Khatua, Bhanu Bhusan  
Ph.D. (IIT Kharagpur), Polymer-clay and Polymer-CNT Nanocomposites, Polymer Blends and Composites, Polymer Blend-Clay nanocomposites: Morphology control, Polymeric PTCR composites, Polymer-Graphene Nanocomposites, polymer-carbon nanohorn nanocomposites
Faculty Appointments
Prof. Debabrata Pradhan Assistant Professor

Faculty Retirement
Ajit Kumar Banthia Professor

Brief Description of on-going activities
Apart from teaching various courses in our M. Tech. Program on Materials Science and Engineering we also teach undergraduate and post graduate level courses on biomaterials, ceramic, polymer and electronic materials to other departments of our Institute. So far as the research activity is concerned our Centre is engaged in development and application of novel polymers, ceramics and semiconductor materials supported by our Institute as well as by various funding agencies. In the area of polymer materials besides polymer modification we synthesize new polymers for application as electronic materials, membranes for gas separation, nanoclay and carbon nanotube reinforced composites for automobiles and other high performance speciality applications. Few research projects are in progress for jute fiber reinforced cement concrete and biodegradable rigid composites. The Centre is now also engaged in a new field of welding thermoplastics, recycling waste polymers and direct fluorination of polymers. Apart from activities on structural ceramics, refractories, and bioceramics, we are also investigating various research issues related to the synthesis of nano-crystalline shape memory materials for biomedical applications, nano-fluids, nano ceramics for drug delivery, nano-structured oxides for ceramic gas sensor and cathode materials for lithium rechargeable batteries. We are also actively involved in the research on ferroic and multiferroic thin/thick films, sensors magnetic and magnetocaloric materials. Novel inorganic and organic semiconductor materials are being synthesized and characterized for various electronic and optoelectronic applications. MOCVD growth of InGaP epitaxial layers as well as quantum dots are also being carried out for various applications such as solar cell, etc. Another important area of research is the synthesis and characterization of wide band gap materials like SiC, ZnO and nitride semiconductors and nano materials for device applications. Multiwall carbon nanotubes are also being synthesized by CVD on silicon substrates.

Thrust Areas
1. Biomaterials
2. Nanomaterials/nanocomposites/sensors

New Acquisitions

Lectures by Visiting Experts
1. Printed electronics: challenges & perspectives by Dr. Heiko Kempa (Chemnitz University of Technology, Germany)
2. Developing magnetic nanostructures for cancer therapy by Prof. D. Bahadur (IIT, Bombay)
3. World of nanostructures & intelligent materials by Dr. Vijayamohanan K. Pillai (NCL, Pune)
4. The fate of charge separation & charge recombination processes within the artificial light energy conversion by Dr. Tapan Ganguly (NML, Jamshedpur)

Doctoral and MS Degrees Awarded

1. M. Rajasekhar : Effects of alloying additives on structural, thermal and magnetic properties in exchange coupled Nd-Fe-B nanocomposites(Ph.D.)
2. Alok Kumar Sen : Taste response behaviour of functionalized polymers(Ph.D.)
3. Sayanee Majumdar : Structural, optical and electrical properties of nitrogen and lithium doped ZnO(Ph.D.)
4. Joydip Sengupta : Growth and characterization of multi-walled carbon nanotubes using chemical vapour deposition(Ph.D.)
5. Rajdeep Dasgupta : Transdermal iontophoretic drug delivery polymeric hydrogel membranes(Ph.D.)
7. Suman Kumar Sen : New cardo group containing fluorinated poly(ether imide)s and gas transport properties(Ph.D.)

Member - Professional Bodies

1. Jacob, Chacko, Regular - National Academy of Sciences, India
2. Banerji, Pallab, Regular - MRS, USA
3. Banerji, Pallab, Member - IEEE, USA
4. Banerji, Pallab, Life - IACS
5. Banerjee, Susanta, Life Member - Materials Research Society of India (MRSI)
6. Banerjee, Susanta, Life Member - Society for Polymer Science India (SPSI)
7. Majumder, Subhasish Basu, Life Member - Materials Research Society of India
8. Khatua, Bhanu Bhusan, Life member - Society of the Polymer Science India
9. Adhikari, Basudam, Life Member - Materials Research Society of India
10. Adhikari, Basudam, Life Member - Society of Biomaterials and Artificial Organs (India)
11. Adhikari, Basudam, Life Member - Society of Polymer Science India
12. Adhikari, Basudam, Life Member - Biosensor Society of India
13. Adhikari, Basudam, Member of Regional Advisory Committee - CIPET, Haldia, West Bengal
14. Ram, Shanker, Regular - Life member of powder metallurgy association of India
15. Ram, Shanker, Regular - Life member of laser and spectroscopy society of India
16. Ram, Shanker, Regular - Member of the national academy of sciences, MNSc, Allahabad
17. Ram, Shanker, Regular - Member of international board of biography (USA)
18. Ram, Shanker, Regular - Life member of society for materials chemistry (SMC), BARC, Mumbai
19. Ram, Shanker, Regular - Life member of MRSI (India)
20. Ram, Shanker, Regular - Life member of magnetic society of India

Member - Editorial Board

1. Adhikari, Basudam (2010) Member of Editorial Board - Indian Journal of Chemical Technology, CSIR
3. Das, Chapal Kumar (0) Member of the Editorial Board - WJNSE
4. Das, Chapal Kumar (0) Member of the Editorial Board - Research Letters in Materials science
5. Das, Chapal Kumar (0) Member of the Editorial Board - Nano Trends
6. Das, Chapal Kumar (0) Member of the Editorial Board - Advances in Materials Science
9. Pradhan, Debabrata (2011) Associate Editor - Materials Express
10. Ram, Shanker (2011) Editorial Board Member - ISRN Nanotechnology

Awards & Honours

5. Singh, Shubra (2008) Best paper award at ISRS
7. Singh, Shubra (2009) CEFIPRA Post doctoral Fellowship
10. Khatua, Bhanu Bhusan (2002) KOSEF Post Doctoral Research Fellowship from POSTECH-Pohang University of Science & Technology, South Korea

Fellowships


Sponsored Research Projects

1. Development of cotton lap/cellulose pad substitute from jute (National Jute Board, Rs.41.08 Lakhs)
2. DEVELOPMENT OF CURED POLYPHOSPHAZENE FOR WIDE TEMPERATURE RANGE APPLICATIONS (DMSRDE Kanpur, Rs.23.00 Lakhs)
3. Development of durable water-repellent jute geotextiles with natural ecofriendly additive for application in erosion control in river banks (JMDC, Kolkata, Rs.168.73 Lakhs)
4. Development of eco-friendly / biodegradable rigid jute-based composites (JMDC, Kolkata, Rs.69.93 Lakhs)
5. Development of high energy density lithium ion prismatic batteries for laptops, solar and electric vehicles (Future Hi-tech batteries limited, Rs.3.00 Lakhs)
6. Development of jute based sound proofing composites (JMDC, Kolkata, Rs.32.26 Lakhs)
7. Development of jute fiber reinforced cement concrete composites (JMDC, Kolkata, Rs.75.60 Lakhs)
8. Development of MBE Cluster Tool Based Infrastructure and Process Integration Facility for Compound Semiconductor Nano-Devices (Department of Information Technology, Govt. of India, Rs.5000.00 Lakhs)
9. Development of membrane electrode array based novel sensing system for rapid taste characterization of food and agro products (C-DAC, Kolkata, Rs.41.50 Lakhs)
10. Development of novel palladium gas sensors (IBSA (DST Tri-National), Rs.16.28 Lakhs)
11. Development of Organic-Organic and Organic-Inorganic Hybrid Nanocomposites for Supercapacitor Applications (DRDO, New Delhi, Rs.45.00 Lakhs)
12. Development of Phase Morphology in Incompatible Polymer Blends by using Nano-clay (DST, New Delhi, Rs.17.18 Lakhs)
13. Development of sensing element and alarm circuit module for hydrogen detection from rechargeable batteries (Naval Science and Technological Laboratory (DRDO), Vizag, Rs.10.00 Lakhs)
14. Development of Suitable Production System for Natural Rubber Coated Jute Fabrics for Novel End Uses (JMDC, Kolkata, Rs.30.00 Lakhs)
15. Development of volatile compound based biosensor for pest control (DST, New Delhi, Rs.8.65 Lakhs)
16. GaN/InGaN based light emitting diodes, solar cells and photoelectrochemical devices by MOCVD epitaxial processes (DST, New Delhi, Rs.696.00 Lakhs)
17. Heterointerface characterization of MOCVD grown InP quantum dots on Si (Indian beamline, Photon Factory, Japan, Rs.0.00 Lakhs)
18. High strength polyimide-siloxane films with low heat shrinkage (Defence Research & Development Establishment, Gwalior, Rs.9.98 Lakhs)
19. Molecularly engineered novel membrane precursors and preparation of novel polymer nanocomposite membranes for selective separation of gas mixture (DST (Completed), Rs.53.00 Lakhs)
20. Novel polymeric composite membranes for selective separation of gas mixtures (DST, New Delhi, Rs.55.00 Lakhs)
21. Novel polymeric composite membranes for selective separation of gas mixtures (DST, Rs.55.00 Lakhs)
22. Preparation and supply of poly(ether imide siloxane)s as membrane materials in bulk quantity for analytical sample inlet (DRDE (Completed), Rs.8.00 Lakhs)
23. Self-controlled growth of Fe3BO6-δ (δ = 0, 1) nanofibrils with a bonded surface layer from a vitreous glass: A novel magnetodielectric material for (CSIR, New Delhi, Rs.20.00 Lakhs)
24. Silicon Carbide sensors as high temperature MEMS & MOSFET devices. (ISRO (KCSTC), Rs.5.88 Lakhs)
25. Synthesis and characterization of novel light emitting poly(arylene)s and poly(arylene ether)s and derivative thereof (CSIR (Completed), Rs.9.00 Lakhs)
26. Synthesis and multiferroic properties of AFe12O19 (A = Ba, Sr) nanoparticles reinforced nanocomposites for space applications (CSIR, New Delhi, Rs.14.56 Lakhs)
27. Synthesis of mixed metal oxide, and porous oxide nanostructured materials by using hydrothermal technique (ISIRD, SRIC, IIT-Kharagpur, Rs.5.00 Lakhs)
28. Synthesizing super-catalysts and tracking their catalytic pathways (DST, Indo-Korea Int., Rs.25.00 Lakhs)
29. Use of Nanocomposites for Efficient Welding of Thermoplastics (DST, New Delhi, Rs.7.90 Lakhs)

Consultancy Projects

1. Development of jute sapling pot (Indarsen Shamlal Pvt. Ltd., Kolkata, Rs.2.00 Lakhs)
2. Synthesis of the soluble para-aramid polymers (KERMEL-France, Rs.7.00 Lakhs)
3. Synthesis of the soluble para-aramid polymers (phase II) (KERMAL- France, Rs.3.50 Lakhs)
4. Thermoset polymer based meter boxes & distribution boxes: An ecological disaster (Ester Industries Limited, Gurgaon (Completed), Rs.5.00 Lakhs)

Patents (filed / granted)

1. A process for the production of ceramic tiles utilizing fly ash as main base material
2. Biodegradable and rigid natural resin matrix jute fiber reinforced composites
3. Casting of concrete pipe reinforced with chemically modified jute fiber and method of casting such fiber reinforced concrete pipe
4. Chemically modified jute fiber reinforced high strength concrete and process thereof
5. Composition And Method For Making Polyarylene Ether Copolymers
6. Conductive wire comprising polysiloxane/polyimide copolymer blend
7. Conductive Wire Comprising A Polysiloxane /Polyimide Copolymer Blend
8. Conductive Wire Comprising A Polysiloxane/Polyimide Copolymer Blend
9. Durability enhancement of lignocellulosic fibers by vegetable oil treatment
10. Inherent Polymeric PTCR Composites: Article and Associated Device
11. Inherent Polymeric PTCR Composites: Composition and Associated Method
12. Inherent Polymeric PTCR Composites: Composition and Associated Method
13. Microbial transformation of lignocellulosic fibers using ecofriendly reagents for strength and durability enhancement
14. Polysiloxane / polyimide copolymers and blends thereof
15. Polysiloxane/Polyimide Copolymers And Blends Thereof
16. Polysiloxane/Polyimide Copolymers And Blends Thereof
17. Process for Chemically Modified Jute Fiber Reinforced High Performance Cement Sheet
18. Process for chemically modified jute fiber reinforced high performance cement sheet
19. Process for making polysiloxane / polyimide copolymer blends
20. Process For Making Polysiloxane/Polyimide Copolymer Blends

Visits Abroad by Faculty Members

1. Das, Chapal Kumar - To deliver lecture in Kasam-2012 (Kathmandu, Nepal, ) May, 2012
2. Das, Chapal Kumar - Collaborative work under INSA-DFG (Chemnitz, Germany, ) July, 2012
3. Das, Chapal Kumar - To deliver lecture in seminar (Singapore, ) November, 2012
4. Das, Chapal Kumar - To attend conference ACCM-8 for paper presentation (Bangkok, Malaya, ) November, 2012
5. Das, Chapal Kumar - To deliver lecture and discussion for collaboration (Budapest, Hungary, ) June-July, 2012
7. Majumder, Subhasish Basu - Research (Return visit as Humboldt Fellow) (RWTH, IWE-II, Aachen University, Germany, ) 15th May to 14th July 2011
9. Pradhan, Debabrata - Collaboration work (Yeungnam University, South Korea, ) 15 days
10. Banerjee, Susanta - Scientific research through Alexander von Humboldt Foundation (Leibniz-Institut für Polymerforschung Dresden, Germany, ) May-July, 2012 (Two months)

Invited Lectures by Faculty Members

1. New carbo group containing fluorinated poly(ether imide)s and gas transport properties by Banerjee, Susanta (Marburg, Germany)
2. Designing New Polymer Acceptor for Solar Cell Application by Banerjee, Susanta (Kolkata University)
3. Green synthesis of nanofluids and films with fast energy-transfer properties: cosmetics, medicals an by Ram, Shanker (100th Indian Science Congress, Calcutta University, Kolkata)
5. Localizing phonons and surface plasmons in optical nanofluids for fast energy-transfer applications by Ram, Shanker (6th India-Singapore Joint Physics Symposium on Physics of Advanced Materials, Dept. of Physics and Meteorology, IIT, Kharagpur)
6. Synthesis and applications of biological nanofluids by Ram, Shanker (National Conference on Advances in Materials Science and Technologies, Department of Physics, Kakatiya University)
7. Nanostructure and its role in shaping functional materials for diversified applications by Ram, Shanker (National Conference on Advanced Materials, Central Mechanical Research Institute, Durgapur)

9. Learning nanomaterials and applications from nature by Ram, Shanker (One Day Workshop on Advanced Materials and Technology, Dept. of Materials and Metallurgical Engineering, National Institute of Foundry and Forge Technology, Ranchi)


11. Development of Microwave Absorbing Materials Based on DBSA doped Polyaniline/Pb(Zr0.52Ti0.48)O3 Nano by Das, Chapal Kumar (Kathmandu, Nepal)

12. Fabrication of Graphene-Polypyrrole Nanofiber for Supercapacitor applications by Das, Chapal Kumar (Energy Research Institute, NTU, Singapore)

13. In-situ synthesis and electrochemical characterizations of Ni2+ doped Polyaniline/MWCNTs nanocomposi by Das, Chapal Kumar (Energy Research Institute, NTU Singapore)

14. Synthesis of fluorinated CNT/CuFe2O4 compos. & Graphene/MoO3 Compos. for supercapacitor application by Das, Chapal Kumar (Energy Research Institute, NTU Singapore)

15. Thermo-mechanical properties of halloysite nanotubes filled Cyclic Olefin Copolymer (COC) nanocompos by Das, Chapal Kumar (CIPET Lucknow, India)

16. Graphene Supported MnO2 NTs as cathode catalyst for improved power generation in sMFC by Pradhan, Debabrata Basu (Korea)

17. Fabrication and performance evaluation of a microprocessor controlled VOC monitoring system by Majumder, Subhasish Basu (National Environmental Engineering Research Institute)

18. Nano-composite electroceramic thin films by Majumder, Subhasish Basu (University of Kolkata, Salt Lake, Kolkata)

19. Ceramic oxide gas sensor: Laboratory research to commercialization by Majumder, Subhasish Basu (Pricol Limited, Coimbatore, Tamil Nadu)

20. Jute Fiber Reinforced Concrete and Biodegradable Rigid Composites by Adhikari, Basudam (CIPET, Ahmedabad)

21. Novel Applications of Jute in Value Added Products by Adhikari, Basudam (CIPET, Lucknow)

22. GaAs MOS by Banerji, Pallab (Jadavpur University)

23. GaAs based MOS devices by Banerji, Pallab (Institute of Radiophysics & Electronics, Kolkata)

**Short-Term Courses, Training Programmes and Workshops organised**

1. Advanced materials ()
2. Nanotechnology for Electronics & Photonics Applications (2 weeks (3.10.12-17.10.12))
3. Renewable Energy Materials and Their Industrial Application (2 weeks)
4. Renewable Energy Materials and Their Industrial Applications (02 week)

**Papers Published in Journals**

1. A change from second- to first-order transition in (La1-xEux)0.67Ca0.33MnO3 (0≤x≤0.2) By D. De, R. Rawat, S. Ram, A. Banerjee, and S. K. Roy J. Phys.: Condens. Matter 24, 076001-1-5 (2012)


3. A facile route to develop electrical conductivity with minimum possible multi-wall carbon nanotube (MWCNT) loading in poly (methyl methacrylate)/MWCNT nanocomposites By Nilesh K Shrivastava, Prativa Kar, Sandip Maiti and B. B. Khatua Polymer International 61, 168-1692 (2012)


<table>
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<tr>
<th>No.</th>
<th>Title</th>
<th>Authors</th>
<th>Journal / Conference</th>
<th>Year</th>
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<tbody>
<tr>
<td>27.</td>
<td>Effects of gold nanoparticles on rheology of nanofluids containing poly(vinylidene fluoride) molecules</td>
<td>By B. Susrutha, S. Ram, and A. K. Tyagi</td>
<td>Nano Materials 1, 120-127</td>
<td>2012</td>
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<td>28.</td>
<td>Electronic Materials Based on Co0.5Zn0.5Fe2O4/Pb(Zr0.52Ti0.48)O3 Nanocomposites</td>
<td>By Avinandan Mandal and Chapal Kumar Das</td>
<td>Journal of Electronic Materials 42, 121-128</td>
<td>2012</td>
</tr>
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<td>32.</td>
<td>Fabrication and characterizations of biodegradable jute reinforced soy based green composites</td>
<td>By Ajaya Kumar Behera, Sridevi Avancha, Ratan Kumar Basak, Ramkrishna Sen, Basudam Adhikari</td>
<td>Carbohydrate Polymers 88,329-335</td>
<td>2012</td>
</tr>
<tr>
<td>33.</td>
<td>Facile synthesis of polypyrrole nanofiber and its enhanced electrochemical performances in different electrolytes</td>
<td>By S Sahoo, S Dhibar, CK Das</td>
<td>EXPRESS Polymer Letters 6, 965-974</td>
<td>2012</td>
</tr>
<tr>
<td>37.</td>
<td>Graphene/polymer nanofiber nanocomposite as electrode material for electrochemical supercapacitor</td>
<td>By Sumanta Sahoo, Saptarshi Dhibar, Goutam Hatui, Pallab Bhattacharya, Chapal Kumar Das</td>
<td>Polymer 54, 1033-1042</td>
<td>2013</td>
</tr>
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<td>40.</td>
<td>Improvement in mechanical properties of jute fibres through mild alkali treatment as demonstrated by utilisation of the Weibull distribution model</td>
<td>By Aparna Roy, Sumit Chakraborty, Sarada Prasad Kundu, Ratan Kumar Basak, Subhasish Basu Majumder, Basudam Adhikari</td>
<td>Bioresource Technology 107,222-228</td>
<td>2012</td>
</tr>
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</table>


74. Selective dispersion of different organoclays in styrene butadiene rubber in the presence of a compatibilizer By Asish Malas, Chapal Kumar Das Materials & Design 49, 857-865 (2013)


86. Synthesis of embedded and isolated Mg0.5Zn0.5Fe2O4 nano-tubes and investigation on their anomalous gas sensing characteristics By K. Mukherjee and S.B. Majumder Sensors & Actuators: B. Chemical 177 55 (2013)

Papers Presented in Conferences

5. Development of compatibilized styrene butadiene rubber hybrid nanocomposites containing different organoclays and carbon black, By Asish Malas, Chapal Kumar Das, ICRRM 2013, IIT Kharagpur, (2013)

7. Dielectrics and magnetization in partially Cr4+ substituted Zr1-xCrO2 (x=0.2) of a core-shell nanostructure, By A. Sengupta and S. Ram, *6th India-Singapore Joint Physics Symposium on Physics of Advanced Materials*, IIT, Kharagpur, (2013)

8. Dielectrics and magnetization in partially Cr4+ substituted Zr1-xCrO2 (x≤0.2) nanocrystallites of core-shell plates or cuboids, By A. Sengupta and S. Ram, *4th International Conference on Recent Advances in Composite Materials*, International Centre, Goa, (2013)

9. Dielectrics and magnetization in partially Cr4+ substituted Zr1-xCrO2 (x≤0.2) nanocrystallites grown in support over a polymer complex template, By A. Sengupta and S. Ram, *100th Indian Science Congress*, Calcutta University, Kolkata, (2013)

10. Effects of surface magnetism on spin glass and multiferroics in BiFeO3 nanocrystallites, By T. Karan and S. Ram, *100th Indian Science Congress*, Calcutta University, Kolkata, (2013)


13. Ferroelectricity in Pb(Zr0.65Ti0.35)0.6(Fe0.5Nb0.5)0.4O3 of single domain nanocrystals, By N. Kumar, K. K. Bhargav, S. Ram, and R. N. P. Choudhary, *100th Indian Science Congress*, Calcutta University, Kolkata, (2013)

14. Ferroelectricity in Pb(Zr0.65Ti0.35)0.7(Fe0.5Nb0.5)0.3O3 of single domain nanocrystals, By N. Kumar, S. Ram, and R.N.P. Choudhary, *6th India-Singapore Joint Physics Symposium on Physics of Advanced Materials*, Dep. of Physics and Meteorology, IIT KGP, (2013)


16. Frequency and temperature dependence of dielectric constant in Li0.5(1-x)ZnxFe(2.5-x/2)O4 (x≤1.0) nanopowders, By S. Misra and S. Ram, *National Conference on Sustainable Development through Innovative Research in Science and Technology*, Jadavpur University, Kolkata, (2012)

17. Frequency and temperature dependence of dielectric properties in Li0.5(1-x)ZnxFe(2.5-x/2)O4 (x≤1.0) spinel ferrite, By S. Misra and S. Ram, *6th India-Singapore Joint Physics Symposium on Physics of Advanced Materials*, IIT, Kharagpur, (2013)


30. Low temperature synthesis and radiative emission in graphitic carbon in support of gold nanoparticles, By A. Mishra and S. Ram, *100th Indian Science Congress*, Calcutta University, Kolkata, (2013)

31. Magnetodielectrics in Zr$_1-x$Cr$_x$O$_2$ $(x \leq 0.2)$ nanocrystallites from a polymer precursor, By A. Sengupta and S. Ram, *National Conference on Sustainable Development through Innovative Research in Science and Technology*, Jadavpur University, Kolkata, (2012)


41. Optical and dielectric properties in Zr$_1-x$Cr$_x$O$_2$ $(x \leq 0.2)$ of ferromagnetic nanocrystallites, By A. Sengupta and S. Ram, *National Conference on Nanoscience and Nanotechnology*, Techno India, Salt Lake, Kolkata, (2012)


45. Preparation of CTAB assisted nanoplate Co(OH)2/Graphene hybrid material as efficient supercapacitor electrode material, By Debasis Ghosh, Soumen Giri, Chapal Kumar Das, ISJPS-2013, IIT Kharagpur, India, (2013)


49. Semiconducting nano particles in the catalysis of one–dimensional carbon nano structures, By R K Sahoo, Damodar D and C. Jacob, 6th India Singapore Joint Physics Symposium (ISJPS 2013), Kharagpur, (2013)


51. Synthesis and applications of biological nanofluids, By S. Ram, National Conference on Advances in Materials Science and Technologies, Kakatiya University, India, (2012)


55. Synthesis of multifunctional nanocrystalline LaFe0.8Co0.2O3 for CH4 sensor, By K. Bhargav, S. B. Majumder and S. Ram, National Seminar on Advanced Functional Materials, CMERI, Durgapur, (2013)


61. Temperature dependent impedance properties in a ferromagnetic semiconductor Zr1-xCrxCr2O (x≤0.2), By A. Sengupta and S. Ram, International Conference on Materials Science and Technology, St. Thomas College Pala, Kottayam, (2012)

62. The growth and characterization of carbon nanotubes using aluminium as the catalyst by atmospheric pressure chemical vapour deposition, By G. Sreekanth, R. K. Sahoo and C. Jacob, 6th India Singapore Joint Physics Symposium (ISJPS 2013), Kharagpur, (2013)


64. Tunable dielectric properties in Bi1-xFe1+xO3 granular nanostructures, By T. Karan and S. Ram, 17th National Seminar on Ferroelectrics and Dielectrics, SOA University, Bhubaneswar, (2012)

65. Utilization of expanded graphite in butyl rubber compounds for the automobile tube applications, By Chapal Kumar Das, India Rubber Expo & Tyre Show -2013, Mumbai, India, (2013)
66. Zinc ferrite ZnFe2O4 nanocrystallites as a volatile organic compound gas sensor, By S. Misra and S. Ram, 100th Indian Science Congress, Calcutta University, Kolkata, (2013)
Reliability Engineering Centre

**Head**
Prof. Biswajit Mahanty  
Prof. Manoj Kumar Tiwari  
from 01.01.2013

**Professor**
Naikan, V N Achutha  
Ph.D.(IIT Kharagpur), Reliability and Quality Engineering, Condition Monitoring, System Simulation

**Assistant Professor**
Chaturvedi, Sanjay Kumar  
Ph.D., Maintenance Engineering, System Reliability Modelling and Analysis, Reliability Data Analysis, Reliability Estimation

**Senior Lecturer**
Goyal, Neeraj Kumar  
Ph.D.(IIT Kharagpur), Software Reliability, System Reliability Analysis, Probabilistic Risk Assessment, Network Reliability, Accelerated Life Testing

**Faculty Appointments**
Neeraj Kumar Goyal  
Assistant Professor

**Brief Description of on-going activities**

The Centre is developing a Virtual Lab on fault Diagnosis of Rotary Systems. This lab will be useful for virtually creating certain faults in rotating systems and then diagnose the fault and its severity. The centre is also developing a remote monitoring system for fault diagnosis of industrial system which can be used for e-maintenance. Other activities include organizing short term courses on latest topics of Reliability Engineering for officers and engineers of the Industry, Defense Organizations and R & D Establishments. Safety and reliability studies of nuclear power plants and missile systems are other activities.

**Thrust Areas**

1. Software Reliability
2. Condition Monitoring and Maintenance
3. Reliability Testing and Estimation
4. Probabilistic Risk and Safety Analysis

**International Collaborations**

Collaborative Research work on "Software Reliability Modelling" with DNV Norvey is progressing

**Lectures by Visiting Experts**

1. PHM and ALT by Dr. P.V. Varde (BARC Mumbai)
2. Research Trends in Power Systems Reliability by Dr. Vivek Srivastava (Goutam Buddha University, Greater Noida)
3. Training Workshop on Fuzzy sets and Fuzzy Logic Applications by Prof. Ashok Deshpande (University of Pune)

**Member - Professional Bodies**

1. Chaturvedi, Sanjay Kumar, Life - ISTE
2. Chaturvedi, Sanjay Kumar, Member - IEEE
3. Goyal, Neeraj Kumar, Life Member - Society for Reliability and Safety
4. Goyal, Neeraj Kumar, Member - IEEE
5. Goyal, Neeraj Kumar, Member - IEEE Reliability Society
6. Goyal, Neeraj Kumar, Life Member - SYSTEMS SOCIETY OF INDIA
7. Naikan, V N Achutha, Regular - IEEE Reliability Society
8. Naikan, V N Achutha, Member - System Society of India
9. Naikan, V N Achutha, Member - IEEE Society
10. Naikan, V N Achutha, Regular - Institution of Engineers (India)
11. Naikan, V N Achutha, Life Member - Society for Reliability and Safety

**Member - Editorial Board**

5. Goyal, Neeraj Kumar (2012) Member - Life Cycle Reliability and Safety Engineering
17. Naikan, V N Achutha (0) Editorial Board Member - Intl. jl. of Systems Assurance and Management

**Fellowships**

1. Naikan, V N Achutha (2012) Visiting Researcher at University of Maryland, USA

**Sponsored Research Projects**

1. Reliability Assessment of The Large Complex Computer Code (Atomic Energy Regulatory Board (AERB), Mumbai, Rs.6.86 Lakhs)
2. Reliability modeling, Analysis and Prediction of 21 NA (Absolute) Pressure Transducers (ISRO, Rs.8.40 Lakhs)
3. Rotating Machinery fault Simulation lab (MHRD, Rs.52.00 Lakhs)

**Consultancy Projects**

1. ADVANCE STUDIES ON HUMAN RELIABILITY ANALYSIS (NPCIL Mumbai, Rs.12.12 Lakhs)
2. RAMS for Garuda (DRDL Hyderabad, Rs.20.00 Lakhs)
3. Reliability analysis of Permanent magnet machine set and its associated controller (BHEL, Rs.6.60 Lakhs)
4. RELIABILITY MODELING AND PREDICTION OF PROCESS CONTROL SYSTEM (DRDO Panagarh, Rs.8.03 Lakhs)
5. Reliability Prediction and FMEA/FMECA of CFF Oxygen System (DEBEL, Bangaluru, Rs.10.00 Lakhs)
6. Reliability Prediction and Testing of Electrical Products (Crompton and Greaves, Mumbai, Rs.10.00 Lakhs)
7. System study on remote assessment of residual mission reliability of equipment through condition based monitoring (MCEME, Rs.12.98 Lakhs)

Visits Abroad by Faculty Members

1. Naikan, V N Achutha - International Conference (Colombo, ) 28-30 Dec 2011

Invited Lectures by Faculty Members

1. Reliability Introduction, HALT & HASS, RCM by Goyal, Neeraj Kumar (Engineering Staff College of India, Hyderabad)
2. Reliability Modeling and Estimation by Goyal, Neeraj Kumar (DRDO Panagarh)
4. RAMS, HALT & HASS, RCM by Goyal, Neeraj Kumar (Engineering Staff College of India, Hyderabad)

Books Published


Short-Term Courses, Training Programmes and Workshops organised

1. RELIABILITY MEASUREMENT AND DEMONSTRATION METHODS (6 days)
2. Reliability Measurement and Demonstration Methods (October 17-21, 2011)

Papers Published in Journals


Papers Presented in Conferences

Rubber Technology Centre

Head
Prof. Golok Behari Nando

Professors
Bhowmick, Anil Kumar  Ph.D. (IIT Kharagpur), Electron beam modification of polymers, Polymer nanocomposites, Conductive rubber composites for EMI shielding application, Waste plastics modified bitumen for highway application, Dielectric elastomer for smart functions
Chaki, Tapan Kumar  Ph.D. (IIT Kharagpur), Electron beam modification of polymers, Polymer nanocomposites, Conductive rubber composites for EMI shielding application, Waste plastics modified bitumen for highway application, Dielectric elastomer for smart functions
Khaustgir, Dipak  Ph.D. (IIT Kharagpur), Development of Polymer & Composites for Graded Dielectrics and High Voltage Insulation application, Polymer Composites & Nano Composites for Electrical and Electronic applications, Textile Technology for Rubber Product and Protection against Biodegradation
Nando, Golok Behari  Ph.D. (IIT Kharagpur), Polymer Blends and Polymer Nano-Composites, Chemical modification and Grafting of Rubbers and additives, TPEs and TPVs from waste polymers anmd Rubbers

Associate Professors
Chattopadhyay, Santanu  Ph.D. (IIT Kharagpur), Viscoelasticity of polymer composites and nanocomposites, Synthesis and application of block copolymers for drug delivery, Preparation and evaluation of smart / stimuli-responsive nanocomposite materials
Singha, Nikhil Kumar  Ph.D (IIT Bombay), Tailor-made polymers via Controlled Radical Polymerization, Block (AB & ABA) & graft copolymers, Smart and self-healing polymeric materials, Tailor-made polymer nanocomposites, Thermoplastic elastomers (TPE), Polyurethane, Tailor-made modification on elastomers

Assistant Professors
Chakraborty, Kalyan Kumar  Ph.D. (Calcutta Univ), Composite, Biomaterilas, Characterization and utilization of Materials
Naskar, Kinsuk  Ph.D. (Univ. of Twente, The Netherlands), Short fibre reinforced composites, Thermoplastic elastomers (TPEs) and Thermoplastic vulcanizates (TPVs), Electron beam (EB) and photocrosslinking of polymers and elastomers, Tyre Technology, Shape memory polymer alloys

Brief Description of on-going activities

The Centre works in close collaboration with other departments and centers of this Institute and other R & D organizations in India and abroad. Several research projects sponsored by different agencies are in operation. The faculty members are engaged in different research areas: (1) Polymer composites and nanocomposites (2) Chemical modification of rubbers, (3) Thermoplastic elastomers based on novel blends and alloys, (4) Recycling of rubber waste (5) Ionomers, (6) Conductive rubber composites for electrical and electronics application, (7) Electron beam modification of polymers (8) Rheology and processability of rubber compounds and polymer blends, (9) Polymer foam and microcellular rubber composite for various critical and industrial applications, (10) Development of rubber blends and composites for different industrial application like cable, oil seal, tank track pad, vibration isolators, high voltage insulators (11) Development of adhesives and coatings. (12) Development of biodegradable polymer and recycling of rubber and polymer (13) Controlled radical polymerization, (14) Development of polymers for, biomedical application, electronic application. Centre will initiate two research projects under Centre for Railway Research (CRR), IIT Kharagpur.
**Thrust Areas**

Recycling of waste polymer & rubber. Rubber in medical and health care applications.Rubber composites for high temperature and high voltage application.

**New Acquisitions**

1. Dynamic Mechanical Analyser(DMA)- Metraviv, France

**Lectures by Visiting Experts**

1. by Prof. H.A. klok (EPFL, Switzerland)
2. by Dr. M. Moukwa (Vice-President Asian Paints Ltd. Mumbai)

**Doctoral and MS Degrees Awarded**

1. Madhuri Nanda : Effect of Conductive Carbon Black and Curing Systems on the Mechanical, Electrical and Rheological Properties of Chlorosulfonated Polyethylene Rubber(Ph.D.)
2. Ananta Kumar Mishra : Thermoplastic Polyurethane- modified Laponite Clay Nanocomposites(Ph.D.)
4. Suman Mitra : Nanogels and Nanocomposite Gels: Preparation, Characterization and Their Effect on the Properties of Virgin Elastomers(Ph.D.)
5. K. Dinesh Kumar : Influence Influence of Tackifiers and Nanoclays on Autohesive Tack of Brominated Isobutylene-co-p-methylstyrene Elastomer(Ph.D)
6. Mithun Bhattacharya : Structure-Property Relationships of Elastomer Nanocomposites with Particular Reference to Wear Resistant Applications(Ph.D.)
9. Jyoti Prakash Rath : Modifications of different fibrillar macro and nano fillers and their effects on natural rubber composites with special(Ph.D.)

**Member - Professional Bodies**

1. Singha, Nikhil Kumar, Regular - Member of Materials Research Society of India (MRSI)
2. Singha, Nikhil Kumar, Life Member - Chemical Research Society of India (CRSI)
3. Singha, Nikhil Kumar, Member - American Chemical Society (ACS), Rubber Division, USA
4. Singha, Nikhil Kumar, Life Member - Society of Polymer Science of India
5. Chattopadhyay, Santanu, Member - Materials Manufacturing Ontario (Ontario, Canada)
6. Chattopadhyay, Santanu, Life Member - Society for Polymer Science, India
7. Chaki, Tapan Kumar, Life - Indian Thermal analysis Society, India
8. Chaki, Tapan Kumar, Life - Materials Research Society of India
9. Chaki, Tapan Kumar, Life - Indian Rubber Institute, India
10. Chaki, Tapan Kumar, Life - Plasma Science Society of India
11. Chaki, Tapan Kumar, Life - Society of Polymer Science
12. Chakraborty, Kalyan Kumar, Life member - Institution of Engineers
13. Chakraborty, Kalyan Kumar, Life Member - Phi Lambda upsilon, USA
14. Chakraborty, Kalyan Kumar, Life Member - Indian Institute of Chemical Engineers
15. Chakraborty, Kalyan Kumar, Life Member - Asiatic Society
16. Nando, Golok Behari, Life - Society for Polymer science , India
17. Nando, Golok Behari, Regular member - Indian Rubber Institute
18. Nando, Golok Behari, Life - Indian Association for Radiation Protection
19. Nando, Golok Behari, Regular - American Chemical Society, Rubber Division, Akron, Ohio, USA
20. Nando, Golok Behari, Life - Materials Research Society of India,
21. Khastgir, Dipak, Member - American Chemical Society, Rubber Division.
22. Khastgir, Dipak, Life Member - Indian Thermal Analysis Society
23. Khastgir, Dipak, Life Member - Polymer Society of India

**Member - Editorial Board**


**Awards & Honours**

1. Naskar, Kinsuk (2009) Alexander von Humboldt Research Fellowship Award (Germany)
2. Bhowmick, Anil Kumar (2002) Chemistry of Thermoplastic Elastomers Award by the American Chemical Society
3. Bhowmick, Anil Kumar (1990) Commonwealth Award by the Association of Commonwealth Universities, UK
5. Singha, Nikhil Kumar (2012) Fifth Polymer Foundation Award by Professor Sukumar Maiti Polymer Award Foundation
6. Bhowmick, Anil Kumar (1997) George Stafford Whitby Award from the American Chemical Society
7. Bhowmick, Anil Kumar (1991) JSPS Award by the Japan Society of Promotion of Science
8. Bhowmick, Anil Kumar (2001) K. M. Philip Gold Medal Award by All India Rubber Industry
10. Bhowmick, Anil Kumar (1990) MRF Award by the Indian Rubber manufacturer’s Association

**Fellowships**

2. Khastgir, Dipak (0) TWAS Fellowship to visit Argentina

**Sponsored Research Projects**

1. Application of TPE-General Purpose Elastomer Blends for Use in PCR and TBR Tyres (CEAT Tyre, Vadodara, Rs.23.42 Lakhs)
2. Block and Graft Copolymers in Emulsion (BGC) (Asian Paints Limited, Rs.10.00 Lakhs)
3. Development of Advanced Polymer Materials for Improved electrical/ ESD properties using nano additives for space application (KCSTC, IIT Kharagpur, Rs.7.50 Lakhs)
4. Development of Novel Polymeric Materials for Self-healing Applications (PSA) (DRDO, Rs.16.00 Lakhs)
5. Development of rubber composites based on ethylene acrylic elastomers through electron beam radiation curing for mechanical and electrical application (Bhabha atomic research centre, Rs.18.72 Lakhs)
6. Development of special purpose heat resistant cable insulating compounds based on blends of LLDPE and PDMS rubber by electron beam irradiation techn (Department of Atomic Energy, BARC, Trombay, Mumbai, Rs.13.11 Lakhs)
7. Effect of additives on elec. proper. (Dielec. const. and dielec. stren.) with respect to frequency of Polyurethane and Silicone Rubber as smart materia (DMSRD, Rs.10.00 Lakhs)
8. Failure analysis of outdoor high voltage insulators from Silicone rubber and Silicone rubber blends used by Indian Railways (to be started) (Indian Railways, Rs.78.50 Lakhs)
9. Flexible EMI Shielding Materials from Conductive Rubber Based Composites (ARDB, New Delhi, Rs.14.10 Lakhs)
10. Flexible EMI Shielding Materials from Conductive Rubber Based Composites ((ARDB, Aeronautical Development Board, Govt of India), Rs.15.50 Lakhs)
11. Lab to Land Application of Modified Bituminous Binder using waste Plastics (DST, West Bengal, Rs.3.00 Lakhs)
12. Nanotechnology and radiation processing of organic-inorganic hybrid materials based on thermoplastic elastomer (DST, Rs.9.00 Lakhs)
13. Novel heat and oil resistant thermoplastic Vulcanizates (TPVs): development, characterization and performance (Council of scientific and industrial research, New Delhi, Rs.15.00 Lakhs)
14. Novel Microporous polymeric membrabnes for medical applications (Department of BioTechnology, Ministry of Science and Technology, Govt of India, Rs.34.44 Lakhs)
15. Novel Polymers by Controlled Radical Ring Opening Polymerization (CRROP) of Vinyl Cycloalkane (NVC) (DST, New Delhi, Rs.23.08 Lakhs)
16. Preparasation and characterization of PVC-Silicone blends (DRDO, New Delhi, Rs.24.57 Lakhs)
17. Segmented Polyurethane Laponite clay nano composites for fire and flammability (ISRO, Bangalore, Rs.10.52 Lakhs)
19. The Influence of Magnetic Nanoparticles to Enhance Thermomechanical Properties of SMPs (DRDO, Kanpur, Rs.9.90 Lakhs)

Consultancy Projects

1. Characterization of Emulsion samples (CESP) (Asian Paints Limited, Rs.0.80 Lakhs)
2. Development of Bonder compound without lead oxide (Phoenix Yule Pvt. Ltd., Rs.2.80 Lakhs)
3. Development of Elastomeric Bearings (Hindustan Aeronautics Limited (HAL), Foundry and Forge Division, Bangalore India, Rs.2.25 Lakhs)
4. Development of Two Part Compound for conveyer belt (Phoenix Yule, Kalyani, Rs.3.20 Lakhs)
5. Estimation of Rubber content (Modern Malleables Limited, Kolkata, Rs.0.28 Lakhs)
6. Failure analysis of adhesive joints (TISCO Jamshedpur, Rs.10.00 Lakhs)
7. Identification of polymers (Prag Industries Limited, Lucknow, Rs.0.15 Lakhs)
8. Identification of Rubber Gaskets (Electrosteel casting Ltd., Khardah, Kolkata-700115, Rs.1.68 Lakhs)
9. Research, Identify, Test Rubber Compounding ingredients from Sustainable Sources (Lanxess Elastomers, Geleen, The Netherlands, Rs.6.43 Lakhs)
10. Studies on Constant Contact side Bearer Rubber Pad (MGM Rubber Company, B T Road, Kolkata, Rs.0.50 Lakhs)
11. Thermoplastic Elastomers based on Polymer Blend and Their Nanocomposites (BBAT) (Bridgestone Corporation, Tokyo, Japan, Rs.3.68 Lakhs)
12. To identify and test rubber compounding ingredients from sustainable sources (GECN) (LANXESS Elastomers B.V., The Netherlands, Rs.6.43 Lakhs)

Patents (filed / granted)

1. A single pot process for polar modification on polyolefinic elastomers via controlled graft copolymerization
2. A single pot process for polar modification on polyolefinic elastomers via tailor-made graft copolymerization
3. Method for producing thermoplastic polymer compounds

Visits Abroad by Faculty Members

1. Naskar, Kinsuk - Researcher as Humboldt fellow (IPF Dresden, Germany, ) 15 May- 15 July, 2012 (2 months)
2. Khastgir, Dipak - To present paper and Chair a session Polymer Matrix Composites (ECCM-15 European Conference on Composite Materia, Venice Italy, June 24-28, 2012
3. Naskar, Kinsuk - to Chair a session and deliver a talk at PPS-28 International Conference (Pattaya, Thailand, November 11-16 December, 2012
4. Singha, Nikhil Kumar - Invited Lecture (Virginia Institute of Technology, June 24-29, 2012
5. Khastgir, Dipak - To discuss with Prof B Voit & G. Heinrich about joint collaborative programme between RTC and IPF (IPF Dresden, Germany, May 21-24, 2012
6. Khastgir, Dipak - As a member of CRR group to discuss on collaboration in railway research (Lulea University, Sweden, May 29- June 2, 2011
7. Chaki, Tapan Kumar - Invited lecture (University of Kent, UK, June 8, 2011
8. Naskar, Kinsuk - To deliver an invited talk and discuss about collaborative research work (University of Twente, The Netherlands, July 2-15, 2012

Invited Lectures by Faculty Members

1. PP-EPDM TPVs via EB-induced reactive processing by Naskar, Kinsuk (University of Twente, Enschede, The Netherlands)
2. Macromolecular Engineering via Atom Transfer Radical Polymerization (ATRP) by Singha, Nikhil Kumar (Darjeeling, West Bengal)
3. Tailor-made Functional Polymeric Materials by Controlled Radical Polymerization by Singha, Nikhil Kumar (IGCAR, Kalpakam)

Papers Published in Journals

1. Acrylic AB and ABA Block Copolymers Based on Poly(2-ethylhexyl acrylate) (PEHA) and Poly(methyl methacrylate) (PMMA) via ATRP By D. J. Haloi, S. Ata, N. K. Singha, D. Jehnichen, B. Voit ACS Applied Materials & Interfaces, 4(8), 4200-4207 (2012)


18. Optimising the silane coupling in tread compounds containing carbon silica dual phase fillers  By P. Kumar, N. N. Kunti, A. K. Chandra and K. Naskar*  *Rubber India* 64(12), 62  (2012)


**Papers Presented in Conferences**


Rural Development Centre

Head
Prof. P B Singh Bhadoria

Associate Professors
Bhowmick, Pradip Kumar  Ph.D., D.Litt., Tribal & Rural Development Planning
Lahiri, Debabrata  Ph.D.(BHU, Varanasi), Economics of Renewable Energy Economics of Microfinance Monitoring & Evaluation Technology Transfer
Mahapatra, Subhash Chandra  Ph.D.(IIT Kharagpur), Crop Production and Development Transfer & Management of Rural Technology

Brief Description of on-going activities
A. Teaching : two courses viz. RD30002 and RD30004 at undergraduate level as professional breadth
B. Research and Development: 1. Essential oil production technology; 2. Fish feed production from non-conventional biological sources; 3. Farm level technology for processing of agricultural products. C. Extension: 1. Transfer of agricultural products processing technology; 2. Organization of training and workshops on rural technology application

Thrust Areas
1. Development and Transfer of Technology, Resource Planning and Marketing, Tribal Development

Lectures by Visiting Experts
1. Energy, Ecology and Rural Development by Professor Y P Singh (Distinguished former Professor and Alumnus of IIT Kharagpur)

Member - Professional Bodies
1. Mahapatra, Subhash Chandra, Life Member - Lok Swasthya Parampara Samvardhan Samithi
2. Mahapatra, Subhash Chandra, Life Member - Eastern India Horticulture and Biotechnology Centre
3. Mahapatra, Subhash Chandra, Life Member - Indian Mushroom Growers Association
4. Mahapatra, Subhash Chandra, Life Member - Indian Society of Agricultural Science
5. Mahapatra, Subhash Chandra, Life Member - Mushroom Society of India (MSI)
6. Mahapatra, Subhash Chandra, Life Member - Indian Society for Tuber Crops
7. Mahapatra, Subhash Chandra, Life Member - Association of Food Scientists and Technologists (India)
8. Mahapatra, Subhash Chandra, Life Member - Weed Science Society, West Bengal
9. Lahiri, Debabrata, Annual - Indian Society of Agricultural Economics
10. Lahiri, Debabrata, Life Member - Agricultural Economics Research Association
11. Lahiri, Debabrata, Life Member - Indian Academy of Social Sciences
12. Lahiri, Debabrata, Regular - American Agricultural Economics Association
13. Lahiri, Debabrata, Regular - International Institute of Fisheries Economics and Trade (IIFET)
14. Lahiri, Debabrata, Life Member - Indian Society of Agricultural Marketing
15. Bhowmick, Pradip Kumar, Regular - The Institute of Social Research and Applied Anthropology
16. Bhowmick, Pradip Kumar, Regular - Indian Political Economic Association
**Member - Editorial Board**


**Awards & Honours**

1. Lahiri, Debabrata (1973) *Awarded University Gold Medal for standing first in M.Sc. (Agricultural Economics) Examination of 1973*
2. Mahapatra, Subhash Chandra (2003) *Bharat Jyoti Award from India International Friendship Society*

**Sponsored Research Projects**

1. Demostration of Technologies for Green House Production of Roses and Extraction of Rose Oil (Department of Science & Technology, New Delhi, Rs.17.60 Lakhs)
2. Innovative use of undulating drought prone fragile lateritic wastelands in the remote tribal belt recourse to larger scale production of a kharif mino (Department of Science & Technology, SEED Division, Technology Bhavan, New Mehrauli Road, New Delhi -, Rs.15.15 Lakhs)
3. Innovative use of undulating lands...Niger crop...(IUU) (DST, SEED Division (Tribal Sub Plan), Rs.15.15 Lakhs)
4. Res. & Dev. and Dissemination of Human Energy or Minimal Energy Driven Composit Devices for Farm Level Processing of Agricultural Products: 2nd phase (Directorate of Agricultural Marketing, Govt. of West Bengal under the RKVY Scheme of Govt, Rs.25.00 Lakhs)
5. Research & Development and Dissemination of Appropriate Technology for Small Scale Grain Storage for Value Addition, Improving Marketability and Incom (Department of Agriculture MW & C Branch Government of West Bengal Marketing, Rs.40.00 Lakhs)
6. Research & Development and Dissemination of Human Energy or Minimal Energy Driven Composit Devices for Farm Level Processing of Agricultural Products (Department of Agriculture, MW&C Branch, Government of West Bengal, Rs.43.00 Lakhs)
7. Research & Development and Dissemination of Human Energy or Minimal Energy Driven Composit Devices for Farm Level Processing of Agricultural Products: (Department of Agriculture MW & C Branch Government of West Bengal Marketing, Rs.25.00 Lakhs)

**Technology Transferred**

1. Rural Entrepreneurs - Pulse Dehusking : Rs. 0.17 Lakh
2. Rural Entrepreneurs - Seed oil Extractor : Rs. 0.22 Lakh
3. Rural Entrepreneurs - Spice & grain Grinder : Rs. 0.22 Lakh
4. Rural Entrepreneurs and SHGs - Starch Extroctor from Tuber crops : Rs. 0.12 Lakh

**Patents (filed / granted)**

1. A Composite Technology of Turmeric (C. longa) Processing Including Polishing, Grinding and Extraction of Turmeric Oil and Curcumin at Rural Level
2. Low cost extractor for Turmeric oil and curcumin

**Invited Lectures by Faculty Members**

1. Problem and Issues in Rural Development by Bhowmick, Pradip Kumar (Haldia Govt. College)
2. Role of Action Anthropology for Tribal Development by Bhowmick, Pradip Kumar (Mahisadal Girls College)

### Papers Published in Journals


With the emerging developments in the area of Telecommunications, it appeared worthwhile to work towards a specialized MTech programme on Telecommunication Network Engineering from GSSST, which should be non-overlapping but supportive to the existing MTech programmes in the related departments, viz., E&ECE, CSE, EE, SIT. In particular, to start with, GSSST can offer some worthwhile telecom-centric elective subjects for the MTech/PhD courseworks for the electrical-science group of the Institute, viz., Core Telecom Networks, Broadband Mobile Communications, Physical & MAC Layer, 4G, OFDM, MIMO, Packet Scheduling, Link Adaptation, Femto Cells, Full Name: Suvra Sekhar Das. From this viewpoint, the GSSST has started offering Broadband Access Networks from Spring 2011 with encouraging response from the student community. The lecture classes of this subject are currently being attended by about 35 BTech/MTech/MS/PhD students from E&ECE, CSE, EE Departments, GSSST and SIT. It is felt that, the other subjects, as envisaged, would also have similar response from the students. As planned at the moment, initially two/three new subjects from the above subject pool would be offered in the two semesters from the GSSST. In due course of time, having secured a critical mass in the faculty, the GSSST should be able to start the envisaged MTech programme. As a follow-up of the envisaged MTech programme, appropriate laboratory development activities for the course curriculum have also been started with the participation of PhD and MS students of GSSST.

**Brief Description of on-going activities**

1. MAC protocols in Wireless Adhoc Networks and WMAN
2. Physical Layer Technologies for Next Generation Cellular, WMAN and WLAN
3. Loss-less Compression Methods for Images and Pictures
5. Synchronization algorithms for OFDM based wireless transmission
6. Physical Layer Modeling of Light Paths in WDM based Passive Optical Networks
7. Wireless Sensor Networks
8. Physical Layer Issues related to UWB communication
9. Radar signal processing
10. BioMedical Signal Acquisition and Processing

With the emerging developments in the area of Telecommunications, it appeared worthwhile to work towards a specialized MTech programme on Telecommunication Network Engineering from GSSST, which should be non-overlapping but supportive to the existing MTech programmes in the related departments, viz., E&ECE, CSE, EE. In particular, to start with, GSSST can offer some worthwhile telecom-centric elective subjects for the MTech/PhD courseworks for the electrical-science group of the Institute, viz., Core Telecom Networks, Broadband Access Networks, Teletraffic Engineering, Telecommunication Network Management, Wireless Sensor Networks, Telecommunication Network Security etc., which are not currently offered from the other departments.
Engineering, Telecommunication Network Management, Wireless Sensor Networks, Telecommunication Network Security etc., which are not currently offered from the other departments. From this viewpoint, the GSSST has started offering Broadband Access Networks from Spring 2011 with encouraging response from the student community. The lecture classes of this subject are currently being attended by about 35 BTech/MTech/MS/PhD students from E&ECE, CSE, EE Departments, GSSST and SIT. It is felt that, the other subjects, as envisaged, would also have similar response from the students. As planned at the moment, initially two/three new subjects from the above subject pool would be offered in the two semesters from the GSSST. In due course of time, having secured a critical mass in the faculty, the GSSST should be able to start the envisaged MTech programme. As a follow-up of the envisaged MTech programme, appropriate laboratory development activities for the course curriculum have also been started with the participation of PhD and MS students of GSSST.

Recently another new initiative has been undertaken with the encouragement from the DOT, Govt. of India, towards exploring a possible activity for developing a Telecommunication Equipment Testing and Security Certification Centre. The proposal is under progress and will soon be presented to the relevant committee of experts for necessary approval.

1. Current number of PhD Students involved in research within GSSST: No. of Scholars completed PhD 14 (07: GSSST enrolment, 07: E&ECE enrolment); No. of Scholars working towards PhD 11 (GSSST enrolment); 2. Current number of MS and MTech Students involved in research within GSSST: No. of students completed MS 10 (GSSST enrolment) No. of students working towards MS 07 (GSSST enrolment) No. of students worked on MTech projects 40 (GSSST enrolment) No. of students working on MTech projects 06 (E&ECE enrolment)

GSSST is currently involved in the following sponsored projects: 1. Project Title: Vodafone-Essar-IIT Centre of Excellence in Telecom. (VEICET); Project Investigator: Professor In-Charge, VEICET: Prof. S. Chakrabarti (15 faculty members from 06 departments are involved in 09 projects addressing various aspects of telecommunication systems and networks); 2. Project Title: Development of Interference Mitigation Methods through Base Station Cooperation in Next-Generation Wireless Broadband Mobile Communication Networks (4G & Beyond), DIT, Govt. of India; Project Investigator: Prof. S. S. Das; 3. Project Title: Studies on Fade Mitigation Techniques for Satellite Propagation in Ka-Band, ISRO, Govt. of India; Project Investigator: Prof. S. S. Das; 4. Project Title: Fading Channel & Mobile Comm., MHRD, Govt. of India; Project Investigators: Prof. S. S. Das


**Thrust Areas**


**New Acquisitions**

1. FPGA test/ Programming facility with data acquisition cards
2. Radio Transceivers with FPGA test/ Programming facility
3. Embedded DSP Board with data acquisition
4. OPTSIM: An Optical Communication System Design and Simulation tool
International Collaborations

In the spring semester, 2011, the school has also explored an overseas research collaboration by supervising a PhD scholar from University of California, Davis, who visited GSSST for two months (January – March 2011) on an NSF-funded project and carried out research in the area of optical networks, addressing the problems of metro-access network integration using WDM-based optical networking technologies.

Lectures by Visiting Experts

1. BioMEMS by Dr. A. T. Kalghatgi (CRL, BEL)
2. Next Generation Networks by Prof. Ramjee Prasad (University of Alborg)
3. by Prof. Partha P. Pande (Washington State University, Pullman)
4. by Arka Mazumder (E. L. Ginzton Laboratory, Stanford)
5. by Prof. B. Mukherjee (University of California, Davis)

Doctoral and MS Degrees Awarded

1. Jayadev Bhaumik : Error Control Coding and Cryptography(Ph.D)
2. Lakshi Prasad Roy : Radar Target Detection in Correlated non-Gaussian Clutter Environment(Ph.D)
3. Valadi Sivarama Krishna : Wireless Secured Communication(MS)
5. Chinnmay Chakraborty : PSTN-IP Telephony Gateway Over Heterogeneous Networks(MS)
6. Tuhin Subhra Chakraborty : MB-OFDM, VLSI Architecture(MS)
7. Sruti Ganchaudhuri : Video Communication(MS)
8. Chinnmayee Nanda : Bio-medical Signal Processing and Acquisition(MS)

Member - Professional Bodies

1. Das, Suvra Sekhar, - IEEE
2. Das, Suvra Sekhar, Member - IEEE
3. Chakrabarti, Saswat, Member - IEEE

Awards & Honours

1. Chakrabarti, Saswat ( 2005) B. R. Nag Design Contest Award for Best Design Entry; 18th Int. Conf. on VLSI Design and 4th Int. Conf. on Embedded Systems, 2005

Sponsored Research Projects

1. Design and Simulation of Baseband Digital CDMA Transceiver (ITR, DRDO, Rs.9.50 Lakhs)
2. Development of Interference Mitigation methods through Base Station Cooperation in Next Generation Wireless Broadband Mobile Communications Networks (DIT, Rs.90.60 Lakhs)
3. Development of Interference Mitigation methods through Base Station Cooperation in Next Generation Wireless Broadband Mobile Communications Networks (DeITY, Rs.90.60 Lakhs)
4. Energy Efficient Radio for Next Generation Cellular (VIECET, Rs.100.00 Lakhs)
5. Energy Efficient Radio for Next Generation Cellular (Vodafone, Rs.185.00 Lakhs)
6. Fading Channel & Mobile Communications (MHRD, Rs.50.00 Lakhs)
7. Fading Channel & Mobile Communications (MHRD, Rs.53.00 Lakhs)
8. Self Configuring Networks: Flexible Spectrum Sharing for Home Base Station in Next Generation Mobile Telecommunication Systems (Vodafone, Rs.19.00 Lakhs)
9. STANDARDIZATION ACTIVITY IN 4G & BEYOND IN RAN. (Vodafone, Rs.32.75 Lakhs)
10. STANDARDIZATION ACTIVITY IN 4G & BEYOND IN RAN. (VIECET, Rs.32.00 Lakhs)
11. Studies on Fade Mitigation Control for Microwave Satellite Signal Propagation (ISRO, Rs.10.00 Lakhs)

**Patents (filed / granted)**

1. A Method for Ensuring High Volp Capacity in LTE
2. A method to obtain high data rate and continued service over multiple radio access networks
3. A novel multirate orthogonal frequency division multiplexing system proposal to reduce intercarrier interference
4. Enhancing spectral efficiency of OFDM systems by Data Transmission over Pilot Tones

**Books Published**


**Papers Published in Journals**


**Papers Presented in Conferences**

5. Call Admission Control for Real-Time Traffic in OFDMA Based Cellular Networks, By Subhendu Batabyal, Suvra Sekhar Das, National Conference on Communications 2013, (NCC13), IIT Delhi, (2013)
Rajendra Mishra School of Engineering Entrepreneurship

**Head**
Prof. Dhrubes Biswas

**Professor**
Biswa, Dhrubes  

**Assistant Professors**
Bhattacharjee, Titas  
*Fellow of IIM Calcutta,*

Bhowmick, Bhaskar  
*FPM (IIM, Ahmedabad)*, Environment and Strategy, Designing Innovation & Entrepreneurship Platform, Strategy-Succession-Strategy

Chakraborty, Basab  

Prabha Bhola  
*Ph.D. (IIT Kharagpur), MSME Growth and Sustainable Development, Modelling of Scalable Ventures, Service Quality and Performance Management*

Roy, Ram Babu  
*Fellow, IIM Calcutta (Ph D), Social Network Analysis and Mining, Business Intelligence, Pattern Mining in Financial Markets, Product Development, Entrepreneurship Network*

**Member - Professional Bodies**

1. Roy, Ram Babu, *Associate Member* - The Institution of Electronics and Telecommunication Engineers (IETE)
Sponsored Research Projects

1. Technology Incubation and Development of Entrepreneurs (TIDE) (DIT, Rs.155.00 Lakhs)
2. Technology Refinement & Marketing Programme (TREMAP) (TIFAC, Department of Science & Technology, Government of India, Rs.40.00 Lakhs)
3. TEPP Outreach Centre (DSIR, Rs.8.00 Lakhs)

Patents (filed / granted)

1. Low Water Loss Battery

Visits Abroad by Faculty Members

1. Biswas, Dhrubes - Key note address (Univ of California, Berkeley, USA) 05-11-2012 to 09-11-2012
2. Biswas, Dhrubes - Collaboration between our two premier universities, as a part of the Indo-Taiwan Science & Technology (National Chiao Tung University, Taiwan) 25-02-2013 to 28-02-2012
3. Biswas, Dhrubes - Conference (17th International MBE conference, Japan) 24-09-2012 to 28-09-2012

Invited Lectures by Faculty Members

1. Compound Semiconductor Devices by Biswas, Dhrubes (NIT Rourkella, India)
2. Building Effective EDP model for S&T Group by Biswas, Dhrubes (Lucknow, India)
3. Invited talk on Bio-Entrepreneurship, Technology Management and Entrepreneurship by Biswas, Dhrubes (Dibrugarh University, Dibrugarh, India)
4. Keynote address on Innovation and Entrepreneurship by Biswas, Dhrubes (Univ of California, Berkeley, USA)

Books Published


Short-Term Courses, Training Programmes and Workshops organised

1. Faculty Development Programme - Academic Aspects of Entrepreneurship (2 weeks)
2. Faculty Development Programme - Entrepreneurship theory and Practice (2 weeks)

Papers Published in Journals

5. Analytical Modeling of Transmission coefficient of Al0.2Ga0.8N/GaN Resonant Tunneling Diode In Presence and Absence of Electric Field By S. Chowdhury, D. Biswas Journal of Electron Devices 13, 1002-1005 (2012)


7. Effect of Device Parameters on Transmission Coefficient of Al0.2Ga0.8N /GaN Resonant Tunneling Diode grown on Silicon Substrate By S. Chowdhury, D. Biswas Int. J. of Nanoelectronics and Materials (2013)


12. Quantum well engineering of InAlAs/InGaAs HEMTs for low impact ionization applications By U.P.Gomes, Y. Chen, S.Kabi, P.Chow and D. Biswas Current Applied Physics (2012)


Papers Presented in Conferences


9. Logic Performance and Strain Analysis of Al0.50In0.50As/ln0.53Ga0.47As/ Al0.50ln0.50As Metamorphic HEMT, By U. P. Gomes, K. Takhar, S. Rathi and D. Biswas, ICOCENT 2012, Jaipur, India, (2012)

10. Metal-Insulator Field-Plate Technology for Alleviation of Short-Channel Effects in Nanoscale In0.52Al0.48As/In0.53Ga0.47As InP-based HEMTs, By Y. K. Yadav, K. Ranjan, S. Rathi, and D. Biswas, ICOCENT 2012, Jaipur, India, (2012)
11. Novel Analytical model for current-voltage characteristics and transconductance of undoped AlGaN/GaN MISHFET’s and performance comparison with different high-k dielect, By R. Ganta, S. Ghosh and D. Biswas, ICMST 2012, Kerala, India, (2012)
Rajiv Gandhi School of Intellectual Property Law

**Head**
Prof. M. Padmavati    from 15.09.2012  
Prof. K. Vibhute    from 04.03.2013

**Associate Professor**
M. Padmavati  
Ph.D.(Central Univ. Hyderabad), Plant Metabolic Pathways Drug regulation TK and Biodiversity Patent analysis and commercialisation

**Assistant Professors**
Bandyopadhyay, Tapas Kumar  
Banerjee, Arpan  
LLM (Univ of London),
Basu, Arindam  
Dube, Dipa  
Ph.D.(Calcutta University), Violence against Women, Police Investigation and reforms
Dube, Indrajit  
Ph.D.(Calcutta University), Corporate Law & Governance, Environmental Governance, Competition Law
Raju, K. D.  
Shankar, Uday  
Shreya, Matilal  
LL.M.(Case Western), Secondary Copyright Infringement
Subramanian  
LLM, Euro-Master (Germany), International law, International Human Rights law, International Investment law

**Faculty Resignation**
Archana Chugh  
Assistant Professor

**Brief Description of on-going activities**

**Thrust Areas**
1. Intellectual Property Law
2. Corporate Laws
3. Environmental Laws

**Lectures by Visiting Experts**
1. Patent Drafting by Mr. Anjan Sen (Anjan Sen and Associates)
2. Crisis in CJS in India by Prof. B.B. Pande (Ex- Prof. Delhi University)
3. Doctrine of Equivalence by Prof. Martin J. Adelman (George Washington University)
4. Law of taxation by Mr. Khalid Aizaz Anwar (Joint Commissioner, Dept. of Commercial taxes)
5. Understanding the Human Rights Dimension of Investment Law by Prof. Susan Karamanian (George Washington University)
6. Competition Law by Prof. Morgan (George Washington University)
7. Judicial Accountability by Prof. M.P. Singh (Vice Chancellor NUJS)
8. Corporate Human Rights by Vanessa Zimmerman (Legal Adviser to the Special Representative of the UN Secretary General on Business and Human Rights)
9. Government procurement Law in India and US by Prof. Chris Yukins (George Washington University)

**Member - Professional Bodies**

1. M. Padmavati, Member - Scientific Committee Member, Food Safety Standards Authority India
2. M. Padmavati, Member - West Bengal Science and Technology Council
3. M. Padmavati, Life Member - Biotech Research Society of India
4. M. Padmavati, Member - Zonal Institute of Technology Management Committee (ZITMC), NIRJAFT, Kolkata
5. M. Padmavati, Member - International Patent Information User Group
6. M. Padmavati, Member - Biotech Consortium India Limited
7. M. Padmavati, Member - World Bioenergy Association
8. Dube, Indrajit, Academic Member - European Corporate Governance Institute, London
9. Dube, Indrajit, Member - Corporate Law Teachers Association, Sydney
10. Dube, Dipa, Regular - International Society of Victimology
11. Dube, Dipa, Life - Indian Society of Criminology
12. Raju, K. D., Life Member - Indian Society of International Law
13. Raju, K. D., Nominated - IUCN CEL
14. Shankar, Uday, Member - International Association of Constitutional Law
15. Basu, Arindam, Member - International Environmental Association
16. Basu, Arindam, Member - Greenpeace India
17. Subramanian, Member - Society for International Economic Law
18. Subramanian, Associate Member - Indian Society of International Law
19. Subramanian, Member - British Institute of International and Comparative Law

**Member - Editorial Board**

1. Bandyopadhyay, Tapas Kumar (2011) Member - Recent Patent in nano-technology
5. Dube, Indrajit (2011) Member - Public Administration Research
10. Subramanian (2012) Member, Board of Editors - International Journal of Legal Studies and Research

**Sponsored Research Projects**

1. Bioactive peptide synthesis from honey protein and its characterisation (CSIR, Rs.18.42 Lakhs)
2. Corporate Governance in Energy Sector in India (NFCG, Rs.4.00 Lakhs)
3. Corporate Governance in Energy Sector in India (National Foundation For Corporate Governance, New Delhi, Rs.4.00 Lakhs)
4. Creation of Multimedia based Courseware for E&IT students to be implemented by IIT Kharagpur (Dept. of Information Technology, Rs.115.00 Lakhs)
5. Ganga River Basin Management Plan - Policy, Law & Governance (Ministry of Environment, Rs.30.00 Lakhs)
6. IICA Hub (Ministry of Corporate Affair, Rs.40.00 Lakhs)
7. Plant Metabolic Pathway Laboratory (MHRD, Rs.43.00 Lakhs)
8. VAW amongst Urban Slum Population (NCW, Govt. fo India, Rs.3.50 Lakhs)

Consultancy Projects

1. Analyzing European and US patent cases (Longbow Legal Ltd., Rs.4.00 Lakhs)
2. Develop Knowledge Management for IICA (Ministry of Corporate Affair, Rs.6.48 Lakhs)
3. GI Registration of Traditional Handloom Textiles from Orissa (Department of Textiles, Government of Orissa, Rs.19.00 Lakhs)
4. Optimum Utilisation of Land Resources (Greenlnfra Creation Pvt. Ltd., Rs.250000.00 Lakhs)
5. Registration of Kewda Flower from Ganjam District, Orissa (Ganjam Kewda Development Trust, Rs.0.59 Lakhs)
6. Registration of Kewda GI and Rooh from Ganjam District (Access Development Agency, Berhampur, Rs.0.56 Lakhs)
7. Review and Finalizing the Governance Structure of IICA (Ministry of Corporate Affair, Rs.3.24 Lakhs)
8. Review of Mysore 24x7 Water Supply Project Agreement (JUSCO, Rs.40.00 Lakhs)

Visits Abroad by Faculty Members

1. Raju, K. D. - To participate in IWA Conference (Murdoch University, Australia, ) 22-27-November, 2012
2. Raju, K. D. - To participate in Lassnet Conference (Paradeniya University, Sri Lanka, ) 13-16 December 2012

Invited Lectures by Faculty Members

1. Evolving Framework of International Trade Law by Raju, K. D. (GNLU, Gujarat)
2. Geographical Indications from North East by Raju, K. D. (Arunachal Pradesh)
3. Intellectual Property Protection in MSMEs by Raju, K. D. (Kolkata Small Scale Industries Workshop)
4. Overview of Laws on Protection of Women against Violence by Dube, Dipa (Vidyasagar University)
5. Law of Crimes by Dube, Dipa (National University of Study and Research in Law)
6. River Ganga- Need for a special legislation by Dube, Dipa (IPHE, Kolkata)
7. Introduction to Intellectual property by Bandyopadhyay, Tapas Kumar (Durgapur)
8. State Responsibility for War in International Law by Subramanian (Annual Combined Training of National Cadet Corps, Kharagpur)
9. Lecture on Constitutional Law by Shankar, Uday (National University of Study and Research in Law, Ranchi)
10. Institutions under the Constitution by Shankar, Uday (Indian Institute of Technology Kanpur)
11. Save Ganga Movement - Need of Legal Framework by Shankar, Uday (Institute of Public Health Engineers, Kolkata.)
12. Judged Semi-Final of Moot Court by Shankar, Uday (MATS Law School)
14. Comprehensive legislation on River Basins by Dube, Indrajit (‘India Water Impact Summit 2012’ held on 3 - 5 December 2012 at Habitat World, IHC, New Delhi, India)
15. Managing Ganga and Other Water Bodies by Dube, Indrajit (WaterEx World Conference 2013 held on 17th – 18th Jan 2013 at Bombay Convention & Exhibition Centre, Goregaon, Mumbai, India)
16. Benefit sharing in the Post GI Registration in Orissa by Raju, K. D. (Bhubaneswar)
17. Patenting strategy for Herbal Drugs in India. by M. Padmavati (1st International Conference on Management of Intellectual Property and Strategy Mumbai)
19. IP and commercialisation of Recombinant Drugs by M. Padmavati (National Conference on IPR Kolkata)
20. Challenges of prosecution of nanotechnology inventions by M. Padmavati (Indo-US IPR Symposium)
21. Virtual laboratory for Flavonoid Pathway by M. Padmavati (National Seminar on Perspectives of Phytochemistry and Medicinal Plant Conservation, Tirupati)
22. Property Rights in Software- Patent v. Copyright by Shreya, Matilal (Kolkata)
23. Revisiting Internet Governance- Lessons Learned by Shreya, Matilal (Hyderabad)
24. Ganga Basin Management by Shreya, Matilal (Bhubaneswar)

Books Published


Papers Published in Journals

8. Evaluation of Corporate Board and Independent Director in India By Mr. Aparup Pakhira & Dr. Indrajit Dube India International Journal of Judicial Science Vol 1 (2012)
11. Note on Independence of Independent Director By Dr. Indrajit Dube Journal of Institute of Director XVII, 12, p. 13 (2012)
Papers Presented in Conferences

2. Access to Justice for Disabled in India, By Dipa Dube, All India Criminology Conference, NLU Delhi, (2013)
4. Environmental Governance a tool for sustainable business within larger canvas of Corporate Governance – argument in favor, By Dr. Indrajit Dube, International conference on good governance, sustainable development and Environmental justice in SAARC region, University of North Bengal, Darjeeling, (2012)
10. Right to Environmentand Right toDevelopment: A Judicial Conundrum, By Uday Shankar (Co-Author), National Seminar on Environment and Sustainable Development, GGS Indraprastha University, Delhi, (2012)
New Academic Programmes

The School currently offers one M.Tech programme in "Infrastructure Design and Management". The first batch of M.Tech students has been admitted during the 2008-2009 academic year.

Brief Description of on-going activities

The school was inaugurated by Padma Bhushan Professor Lord Shusantha Kumar Bhattacharyya of Warwick Manufacturing group on 18th of August 2008 (Institute Foundation Day). An advisory Council comprising eminent experts from different fields as external experts has been constituted. The first meeting of teh advisory council meeting was held on 29th March 2009.

Thrust Areas

1. Transportation engineering (Planning, design, operation and management of highways, airport and seaport infrastructure) Environmental Engineering (Planning, design, operation and management of water supply and waste management systems, Environmental Impact Assessment) Facilities Infrastructure (Urban infrastructure planning and design, Facility programming and specialized building design, building automation systems design, building management systems, regional infrastructure planning and construction) Power systems (Planning, design, operation and management of Thermal, hydel and Nuclear Power Plants, Renewable Power Plants, Power generation, transmission and distribution, power system planning and reliability) Infrastructure Project management Infrastructure Financing and Infrastructure Regulatory Issues

New Acquisitions

1. The school has acquired 10 desk top computers, PRIMAVERA and MX Roads softwares
School of Information Technology

Head
Prof. Jayanta Mukhopadhyay

Professors
Gupta, Arobinda  Ph.D.(Iowa), Distributed Systems, Mobile Computing
Sural, Shamik  Ph.D, Information and System Security, Image and Video Processing

Associate Professors
Ghosh, Soumya Kanti  Ph.D., Geospatial Database and Web Services, Network Security, Cloud Computing
Misra, Sudip  Ph.D.(Carleton Univ., Canada), Wireless Ad Hoc and Sensor Networks, Internet of Things and Cyber Physical Systems, Computer Networks, Smart Grid Communication
Samanta, Debasish  Ph.D.(IIT Kharagpur), Biometric-Based System Security, Model-Based Software Testing, Human Computer Interaction
Sreenivasa Rao, Krothapalli  Ph.D.(IIT, Madras), Speech Processing, Multimedia Signal Processing, Pattern Recognition, Neural Networks

Assistant Professor
Sahay, Rajiv Ranjan  Ph.D.(IIT Madras), Image Processing and Computer Vision

Faculty Appointments
Prof. Sahay, Rajiv Ranjan  Assistant Professor

Brief Description of on-going activities

Computer and Communication Networks: Development of architectures, protocols and algorithms for mobile ad-hoc networks, vehicular ad-hoc networks, wireless sensor networks and wireless mesh networks, smart grid communications, cloud computing. Geographical Information System: Enterprise-wide GIS database development and its policies and protocols to make it accessible as platform independent and support for decision making are under research and development. Human Computer Interaction: Development of user interfaces for the under privileged users such as language illiterate, physically disabled etc. Application of Information Communication Technology (ICT) for the mass such as multimodal interaction, multimodal text composition mechanism, user modeling, interface adaptation, personalization, evaluation are the some areas of research. Computational modeling to brain for informatics, cognitive behavior is also another active area of research. Speech Processing: Researchers working in this area are focusing on characterization and incorporation of emotions in speech, speaker recognition system for handheld devices in varying background environments and development of Text-to-Speech (TTS) system for Indian languages. Network Security: Various areas of network security are being explored, like penetrating testing, development of new algorithms for cryptography, their efficient and attack-resistant hardware implementation etc. Systems Security: Survivable information system architecture to tolerant with potential information warfare attacks is under development. Such systems are typically characterized by the presence of a large repository of sensitive data in a distributed environment. The architecture takes into account the presence of multiple operating systems and database platforms, their known and potential vulnerabilities as well as possibilities of simultaneous attacks from adversaries. It will be developed as a generic model which can be used to build specific information systems in a number of application domains like e-governance, finance and insurance, education, etc.
**Thrust Areas**

1. Distributed computing, wireless ad hoc and sensor networks, cloud computing, ubiquitous computing, network security, database systems and data mining, systems security, human computer interaction, geographical information system, speech processing, computer vision, VLSI design.

**International Collaborations**

1. Prof. Gerhard Rigoll, Dept. of EE, Technical University of Munich, Germany 2. Prof. V. Atluri, Dept. of MSIS, Rutgers University, USA

**Lectures by Visiting Experts**

1. A computational framework for exploring the role of speech production in speech processing/recognition by Dr. Prasanta Kumar Ghosh (University of Southern California (USC), Los Angeles, USA)
2. GCC Compiler Design Research by Prof. U. P. Khedkar (Indian Institute of Technology Bombay)
3. Cell Phone – the Most Trusted Personal Device (MTPD) for Universal Applications by Dr. Amalendu Chatterjee (Univista Inc. USA)

**Doctoral and MS Degrees Awarded**

1. Aditi Roy : Gait Recognition in the presence of Occlusion(Ph.D.)
2. Pushpita Chatterjee : Trust based Secure Clustering and Routing Schemes for Wireless Ad Hoc Networks(Ph.D.)

**Member - Professional Bodies**

1. Sural, Shamik, Senior Member - IEEE
2. Samanta, Debasis, Senior Mameber - IEEE
3. Sreenivasa Rao, Krothapalli, Regular member - IEEE
5. Sreenivasa Rao, Krothapalli, Regular member - International Speech Communication Association (ISCA)
6. Sreenivasa Rao, Krothapalli, Life Member - Indian Society for Technical Education (ISTE)
7. Misra, Sudip, Senior Member - IEEE
8. Misra, Sudip, Member - ACM
9. Ghosh, Soumya Kanti, Member - IEEE
10. Gupta, Arobinda, Regular - IEEE
11. Gupta, Arobinda, Regular - IEEE
12. Gupta, Arobinda, Regular - ACM
13. Gupta, Arobinda, Regular - ACM

**Member - Editorial Board**

1. Misra, Sudip (2011) Editorial Board Member - IET Networks
7. Misra, Sudip (2011) Associate Editor - Security and Communication Networks (Wiley)
10. Samanta, Debasis (2009) *Member of the Editorial Board* - International Journal of Communication Networks and Distributed Systems

**Awards & Honours**

1. Misra, Sudip (2010) *Alexander von Humboldt Fellowship* (Germany)
5. Misra, Sudip (2010) *Young Engineers Award, The Institution of Engineers (India)*
6. Misra, Sudip (2010) *Young Scientist Award, National Academy of Sciences, India (NASI)*
7. Misra, Sudip (2010) *Young Systems Scientist Award, Systems Society of India (SSI)*

**Sponsored Research Projects**

1. Adaptive Learning-Based Fault-Tolerant Routing in Adversarial Wireless Ad Hoc and Sensor Networks (Council for Scientific and Industrial Research, India, Rs.15.00 Lakhs)
2. Bio-inspired and nature-inspired solutions in wireless ad hoc and sensor networks (Department of Science and Technology, Govt. of India, Rs.7.20 Lakhs)
3. Building Delay Tolerant Peer to Peer Networks (DIT, Rs.55.00 Lakhs)
4. Characterization and incorporation of emotions in speech (ISIRD, IIT Kharagpur, Rs.3.00 Lakhs)
5. Design & Development of Models & Tools for Vulnerability Assessment of Embedded Systems, (Ministry of Defence, New Delhi, Rs.49.20 Lakhs)
6. Design and Development of Integrated Security Risk Management for an Enterprise Network (Department of Information Technology, New Delhi, Rs.73.13 Lakhs)
7. Development of Algorithms for Identifying Individuals using Gait in the presence of Occlusion (CSIR, Rs.12.89 Lakhs)
8. Development of an GeoSMS Framework to facilitate Location based Services (DST, New Delhi, Rs.26.85 Lakhs)
9. Development of Feasibility Assessment Model for Adaptation of Underground Coal Gasification Technology in the North-East Region of India (Department of Electronics and Information Technology, Govt. of India, Rs.32.14 Lakhs)
10. Development of Multimodal User Interface to Internet for Common People in India (Department of Information Technology, Ministry of Information and Communication Technology, Govt. of, Rs.58.00 Lakhs)
11. Development of text to speech (TTS) synthesis system for Indian languages (Phase-II) (Department of Information Technology, Rs.97.94 Lakhs)
12. Enhanced SANYOG: A Portable Communication Tool for the Speech and Neuro Motor Impaired People (Media Lab Asia, Rs.71.00 Lakhs)
13. Prosodically guided phonetic engine for searching speech databases in Indian languages (MCIT, DIT, Rs.60.38 Lakhs)
14. Speaker recognition system for handheld devices in varying background environments (Department of Science and Technology, Rs.23.03 Lakhs)
15. Synthesis of Low Power High Performance Mixed VLSI COME Circuits (Department of Science and Technology, Govt. of India, Rs.26.00 Lakhs)
16. Synthesis of Mixed CMOS VLSI Circuits (Department of Science and Technology, Rs.26.00 Lakhs)
17. Target tracking in Distributed Wireless Sensor Networks in the Presence of Misbehaving Nodes (ISIRD, IIT Kharagpur, Rs.5.00 Lakhs)
18. Towards Robust, Efficient and Secure Data Acquisition in Underwater Sensor Networks (Department of Electronics and Information Technology, Govt. of India, Rs.54.22 Lakhs)
19. Vehicular Communication & Security (under GM-CRL) (GM R&D, Bangalpre, Rs.500.00 Lakhs)
20. Virtual Lab in Software Engineering (Ministry of Human Resource Development, Rs.42.00 Lakhs)
21. Virtual Labs: Advanced Network Technology (MHRD, Rs.35.00 Lakhs)
22. Virtual Labs: Software Engineering (MHRD, Rs.35.00 Lakhs)

Consultancy Projects

1. Design & Development of a Penetration Testing and Security Assessment Tool, (Ministry of Defence, New Delhi, Rs.49.00 Lakhs)

Visits Abroad by Faculty Members

1. Sural, Shamik - Research Collaboration (Rutgers university, USA, ) 10-06-2012 to 17-06-2012
2. Misra, Sudip - Alexander von Humboldt Fellowship (Germany, ) 3 months

Invited Lectures by Faculty Members

1. Introduction to Speech Processing and its Applications by Sreenivas Rao, Krothapalli (V. R. Siddartha Engineering College)
2. IP Education and Research in ICT by Sreenivas Rao, Krothapalli (RGSOIPL, IIT Kharagpur)
4. Cooperation in Ad Hoc and Sensor Networks by Misra, Sudip (International Workshop on Ad Hoc Networks, University of Delhi, New Delhi, India)

Books Published


Short-Term Courses, Training Programmes and Workshops organised

1. Short Term Course on Internet Programming with Java (18 June - 05 July, 2012)
Papers Published in Journals


29. Syllable Specific Unit Selection Cost Functions for Text-to-Speech Synthesis By N. P. Narendra and K. Sreenivasa Rao ACM Transactions on speech and language processing Vol. 9, 24 pages (2012)


Papers Presented in Conferences


41. POSTER: Broadcasting in Delay Tolerant Networks Using Periodic Contacts, By P. Dhole, A. Gupta, A. Sharma, ICDCN 2013, Mumbai, (2013)


43. Real Life Emotion Classification using Spectral Features and Gaussian Mixture Models, By Shashidhar G. Koolagudi, Anurag Barthwal, Swati Deviylal, and K. Sreenivasa Rao,


School of Medical Science & Technology

Head
Prof. Pranab Kumar Dutta

Associate Professors
Chatterjee, Jyotirmoy  Ph.D., Multimodal Medical Imaging-Analysis Regenerative Medicine Cancer Theranostics Natural Healing Agent

Assistant Professors
Bhattacharya, Sangeeta Das  MD (Johns Hopkins Univ.), Evidence Based Health Policy, Internal medicine and pediatrics, Vaccine preventable diseases in HIV infected children, Design and development of electronic health record systems for the management of chronic diseases, Development of College Mental Health Programs in the Indian Scenario
Chakraborty, Chandan  Ph.D.(IIT Kharagpur), Biostatistics & Medical Informatics, Computer Vision & Pattern Recognition for Medical Imaging, Quantitative Microscopy & Computational Pathology, Statistical Machine Learning & Computer Aided Diagnosis (CAD)

Faculty Re-employment
Prof. Sujay Guha  Professor on Re-employmen

Brief Description of on-going activities
• Development of micro-fluidic Biochips / Bio-MEMS for medical application. • Laser speckle imaging of blood-flow in microcirculation. • Development of statistical analyzer & disease pattern recognizer for Oral Pre-cancer and cancer. • Design of an intelligent diagnostic tool through the extraction of diagnostic rules for asthma. • Proteomics and reproductive health • Vaccine preventable diseases in HIV infected children • Integrated macro & micro-imaging on various healing & non-healing wounds including oral & breast precancer & cancer for their early characterization through image processing & analysis as well as integration with clinico-epidemiological features. • Physico-chemical characterization of natural wound healing agents for the development of wound dressing technology. • Development of detailed database on respiratory rhythms for identifying their temporal & spatial characteristics in health & disease. • Development of biodegradable scaffold for tissue engineering and wound research. • In vitro screening of anti-diabetes molecules. • Design of a three dimensional scaffold and drug delivery system in arthritic hip joint. • Signal Transduction • Cancer Biomarker • Oxidative stress and Infertility • Development of natural antioxidant nanoparticles • Proteomics and Metabolomics in Reproductive Health • Neutraceuticals and Herbal medicine

Thrust Areas
and Herbal Medicine - Genetics & Molecular Profiling of Pre-cancer-Cancer & Wounds - Pediatrics HIV

**International Collaborations**

RIKEN, BSI Japan

**Lectures by Visiting Experts**

1. Forebrain development: Patterning, connection and adjustment by Prof. Tomomi Shimogiri (RIKEN, BSI Japan)
2. Astrocytic modulation of in vivo neural activity and sensory plasticity by Professor Hajime Hirase (RIKEN, BSI Japan)

**Doctoral and MS Degrees Awarded**

1. Richa Malviya : Evidence Based High Throughput Computer Assisted Cervical Cancer Pre-Screening System(MS)
2. Dev Kumar Das : Abnormal erythrocyte recognition using microscopic images of peripheral blood smears(MS)
3. Maitreya Maity : Web-enabled distributed healthcare system for pathological information management towards malaria and anaemia detection(MS)
4. Pallab Datta : Bioinspired Approach towards bone grafts based on nano and micro fabrication of phosphorylated polymers(Ph.D.)
6. Rashmi Mukherjee : Oxidative stress induced changes in early and late onset preeclampsia(Ph.D.)
7. Soumi Dey Sarkar : Towards Development of Bilayer Dermal Rudiment with Nano/Microfiber Architecture: A tissue Engineering perspective(Ph.D.)
8. Palak Mehrotra : Screening tool for polycystic ovary syndrome using clinical parameters and ultrasound images(MS)

**Member - Professional Bodies**

3. Chaudhury, Koel, *Life membership* - Indian Society of Biomaterials
5. Chaudhury, Koel, *Life Membership* - The Society for Free Radical Research-India (SFRR-India)
6. Chaudhury, Koel, *Member* - American Society for Reproductive Medicine (ASRM)
7. Chaudhury, Koel, *Life membership* - Indian Society of Andrology
9. Mandal, Mahitosh, *Associate Member* - American Association for Cancer Research
10. Mandal, Mahitosh, *Associate Member* - American Society for Biochemistry and Molecular Biology
11. Mandal, Mahitosh, *Associate Member* - Indian Association for Cancer Research
12. Mandal, Mahitosh, *Associate Member* - Indian Science Congress Association
15. Manjunatha M, *Life Member* - Bio-medical Engineering Society of India
16. Manjunatha M, *Member* - The Institution of Engineers (India)
18. Dhara, Santanu, *Member (Annual)* - TERMIS
19. Dhara, Santanu, *Regular* - Society for Polymer Science, India
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<tr>
<th>Member</th>
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<th>Organization/Association</th>
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<tr>
<td>Dhara, Santanu</td>
<td><strong>Regular</strong> - American Ceramics Society</td>
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<td>Chakraborty, Chandan</td>
<td><strong>Regular Member</strong> - Institute of Electrical and Electronics Engineers (IEEE)</td>
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<td>Chakraborty, Chandan</td>
<td><strong>Life Member</strong> - Indian Society for Medical Statistics (ISMS)</td>
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<td>Chakraborty, Chandan</td>
<td><strong>Life Member</strong> - Indian Science Congress Association (ISCA)</td>
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<td>Chakraborty, Chandan</td>
<td><strong>Regular Member</strong> - European Society of Human Reproduction and Embryology (ESHRE)</td>
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<td>Chakraborty, Chandan</td>
<td><strong>Chairman, Institutional Review Board</strong> - Tata Medical Center, Kolkata</td>
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<td>Chakraborty, Chandan</td>
<td><strong>Regular Member</strong> - Association for Computing Machinery (ACM)</td>
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<td>Mitra, Analava</td>
<td><strong>Member</strong> - Centre of Applied Medicine Kathmandu-Nepal</td>
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<td>Mitra, Analava</td>
<td><strong>Member</strong> - Society for Advanced studies in Medicine and surgery</td>
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<td>Mitra, Analava</td>
<td><strong>Life Member</strong> - Indian Medical Association</td>
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<td>Mitra, Analava</td>
<td><strong>Life Member</strong> - IMA College of General practitioners</td>
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<td>Mitra, Analava</td>
<td><strong>Member</strong> - National Association of Psychologists</td>
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**Member - Editorial Board**

1. Chakraborty, Chandan (2012) **Editorial Board Member** - Research & Reviews : Journal of Medical Imaging and Technology
3. Chakraborty, Chandan (2012) **Member, International Editorial Board** - Artificial Intelligence Research (Canada)
4. Chaudhury, Koel (2013) **Member of Editorial Board** - Medical and Surgical Urology
5. Manjunatha M (2012) **Editor** - American Journal of Biomedical Research
7. Mitra, Analava (2011) **Member** - Indian Journal of Pharmacology
9. Mitra, Analava (2010) **Member of Editorial Board** - International Journal of Life Sciences and Technology
18. Mitra, Analava (2007) **Member Editorial Board** - Anthropology Today: Trends, Scope And Applications, Published by

**Awards & Honours**

1. Bhattacharya, Sangeeta Das () **Associate Faculty**, Johns Hopkins Bloomberg School of Public Health
2. Mandal, Mahitosh (2013) **Best Poster Award at Indian Association of Cancer Research Meeting at Delhi.**
3. Chakraborty, Chandan (2009) **DST Fast Track Young Scientist Award**
4. Dhara, Santanu (2010) **Fast Track Scheme For Young Scientists (FAST) funded by DST, Govt. India**
5. Chakraborty, Chandan (2012) **IBM Faculty Award, NY, USA**
6. Chakraborty, Chandan (2011) IBM-SUR Research Grant Award, India
8. Chakraborty, Chandan (2007) ISCA Young Scientist Award by President of India, Dr APJ Abdul Kalam

Sponsored Research Projects

1. Assessment of endometrial receptivity and its correlation with sub endometrial blood flow (SEBF) in women with latent genital tuberculosis (ICMR, Rs.30.86 Lakhs)
2. Characterization and classification of diabetic maculopathy (IBM Faculty Award Grant, NY USA, Rs.4.00 Lakhs)
3. Computer-aided fundus image analyzer for diabetic retinopathy screening (DBT, Rs.20.66 Lakhs)
4. Design & Feasibility Study of Versatile Low-cost Functional Electrical Stimulator (FES) for Hemiplegics (National Institute for the Orthopaedically Handicapped (NIOH)(Min. of Social Justice & Empowerment), Rs.16.50 Lakhs)
5. Development of a MEMS based assay for biomedical diagnostics (ISRO-IIT Kharagpur cell, Rs.5.50 Lakhs)
6. Development of a Statistical Analyzer based Computer Aided Diagnostic (CAD) System for Asthma (DST, Govt. of India, Rs.13.00 Lakhs)
7. Development of biodegradable polymer encapsulated besifloxacin nanoparticles: a novel therapeutic approach for endophthalmitis (Netra Jyoti Seva Mandiram Veerayatan, Nalanda, Rajgir, Rs.7.56 Lakhs)
8. Development of Ceramic Nanofiber-polymer Resin based Composite for Dental Filler (DST, Govt. of India, Rs.18.80 Lakhs)
9. Development of Ceramics Based Bioactive Scaffold Through Bone Tissue Engineering (BSH) (CSIR, Rs.17.00 Lakhs)
10. Development of Dense and Porous Titanium Components via Powder Metallurgy Route for Biomedical Applications (DRDO, Rs.67.83 Lakhs)
11. Development of neonatal patient care management system (Ministry of Communication and Information Technology, GoI, Rs.0.00 Lakhs)
12. Development of pattern recognition algorithms for quantitative characterization of ovarian ultrasound and Doppler images (WBDSL, Rs.9.00 Lakhs)
13. Does in-vivo antioxidant administration improve semen parameters in infertile men? (Indian Council of Medical Research (ICMR), Rs.9.77 Lakhs)
14. Early prediction of gestational hypertension (Pregnancy induced hypertension): A proteomics approach (Department of Biotechnology, Rs.22.38 Lakhs)
15. Enhanced production, purification and characterization of marine bacterial lipopeptide as potential broad spectrum antimicrobial and anti cancer agent (Ministry of Earth Science, India, Rs.100.03 Lakhs)
16. Evaluation of S100A7 (Psoriasin) as an Early Detection Marker of Squamous Cell Carcinoma. (DST, India, Rs.35.00 Lakhs)
17. Identification of potential biomarkers for the diagnosis of endometriosis: a proteomics approach (DST, Rs.25.20 Lakhs)
18. Impact of immunization programs in children with HIV in West Bengal (IIT SRIC, Rs.3.00 Lakhs)
19. Indian Origin Silk based biomimetic scaffolds for engineering of load bearing tissue (Dept of Biotechnology, India, Rs.34.13 Lakhs)
20. Involvement of functional single nucleotide polymorphisms (DBT, New Delhi, Rs.52.57 Lakhs)
21. Involvement of functional single nucleotide polymorphisms (SNP) of matrix metalloproteinase (MMP) gene promoters in the cell type specific regulation (DBT, Rs.52.00 Lakhs)
22. Metabonomics study of women with polycystic ovary syndrome (PCOS): A system biology approach (Department of Biotechnology, Rs.25.99 Lakhs)
23. Net Shape Fabrication of Dental Crown using Computer Numerical Control (CNC) Machining of Green Ceramic Compacts (DBT, Govt. of India, Rs.46.02 Lakhs)
24. Prevention of Pneumonia in Children with HIV infection (ICMR, Rs.55.00 Lakhs)
25. Role of long-term doxycycline as matrix metalloproteinase (MMP-2 and MMP-9) inhibitor in chronic obstructive pulmonary disease (COPD) (WB DST, Rs.4.65 Lakhs)
26. Separation and electrical characterisation of biological cells using microfluidic device (ADA-NPMASS, Govt of India, Rs.86.75 Lakhs)
27. Sequence Dependent Molecular Action of ZD6474 with Paclitaxel and Radiation in Progress and Treatment of Breast Cancer (PRB) (DBT, India, Rs.35.00 Lakhs)
28. Structural & Molecular Characterization of Cutaneous Cells Behavior under Varied Physico-chemical Ambience towards Improving Skin Tissue Engg. (CCB) (SERB DST, Rs.51.65 Lakhs)
29. To evaluate the Clinical Efficacy of the Functional electrical Stimulation (FES) therapy in Stroke Survivors (Indian Council of Medical Research, Rs.20.00 Lakhs)
30. To investigate the role of MMPs & TIMPs in follicular fluid of women with endometriosis undergoing IVF (DST (West Bengal), Rs.9.64 Lakhs)

**Patents (filed / granted)**

1. A process for Production of Collagen and By-Products from Fresh Water Fish Origin and Applications THEREOF
2. Formulation of a nutraceutical butter for treating psoriasis & eczema
3. iMEdiX to a multi-tier secure modular system for telemedicine and e-healthcare
4. Method and apparatus for enhancing representations of microcalcifications in a digital mammogram image
5. VENUCANE: An Electronic Travel Aid for Visually Impaired Blind People

**Visits Abroad by Faculty Members**

1. Dhara, Santanu - Presenting ongoing work (Vienna, TERMIS world congress, ) 7 days
2. Das, Soumen - Visiting Scientist (FBK, University of Trento, Italy, ) June - July, 2012
3. Mandal, Mahitosh - Collaborative Research (MD Anderson Cancer Center, Houston , TX, USA, ) June, 2012
4. Mandal, Mahitosh - Collaborative Research (Virginia Commonwealth University, Richmond, USA, ) 10th May - 10th July 2012

**Invited Lectures by Faculty Members**

1. Computer Assisted Screening of Malaria Parasite using Machine learning Approach by Chakraborty, Chandan (YCCE, Nagpur. India)
2. Bayesian approach to disease prediction by Chakraborty, Chandan (VNIT, Nagpur)
4. Phosphorylated Polymeric Fibrous Scaffolds: A Novel Approach towards Bioactivity in Bone Tissue E by Dhara, Santanu (IISc Bangalore)
5. Multimodal Imaging in Regenerative Medicine Research by Chatterjee, Jyotirmoy (IISc., Bangalore)
6. Multimodal & Multi-scale Imaging in Addressing Diagnostic Ambiguities of Oral Pre-cancers Maligna by Chatterjee, Jyotirmoy (Bengal Engineering and Science University, Howrah)
7. Retinal Prosthesis by Manjunatha M (Jawaharlal Nehru Centre for Advanced Scientific Research-Bangalore)
8. Retinal Prosthesis by Manjunatha M (Forus Health, Bangalore)
9. PET/ SPECT Imaging Techniques in medicine by Manjunatha M (QIP-Short term course on Medical Imaging in IIT Kharagpur)
11. Antineoplastic and apoptotic potential of traditional medicines thymoquinone and diosgenin in Cancer by Mandal, Mahitosh (Indian Association of Cancer Research, New Delhi)

12. Principles and Clinical Applications of MRI by Chaudhury, Koel (IEEE Medical Imaging Workshop 2012, Indian Institute of Technology, Kharagpur, India)

13. Drinking Water Contaminants and Adverse Pregnancy Outcome by Chaudhury, Koel (Multidimensional technological innovations for water-linked health & wellness: A Bilateral Purdue – India Engagement Conference, Indian Institute of Technology, Kharagpur, India)


15. MEMS and Microsystems by Das, Soumen (National seminar on Smart Instrumentation and Control Systems organised by Department of Electrical Engineering, BESU, Shibpur)

16. Techniques for nano-scale patterning by Das, Soumen (Short-term course on Nanotechnology for electronic & photonic applications organised by materials Science Centre, IIT Kharagpur)

17. Nano engineered MEMS device for space applications - A case study by Das, Soumen (Short-term course on Nanotechnology for electronic & photonic applications organised by materials Science Centre, IIT Kharagpur)

Books Published


Papers Published in Journals


25. Feature Selection and Extraction in Computer Vision System for Breast FNAC Diagnosis: Commonly Perceived Diagnostic Significance of Cytological Features and Postliminary Analysis of an Existing Database By Garud HT, Debdoot Sheet, Ajoy Kumar Ray, Manjunatha Mahadevappa, Jyotirmoy Chatterjee ACM Transactions on Intelligent Systems and Technology [Accepted-JAN 2013] (2013)


**Papers Presented in Conferences**


8. Automated detection of air embolism in OCT contrast imaging: Anisotropic diffusion and active contour based approach, By Basak, K. Patra, R. Manjunatha, M. Dutta, P.K.,
9. BI69A11, a novel small molecule inhibitor of AKT kinase with antitumor activity showed antiproliferative effect on colon cancer by induction of apoptosis. By Ipsita Pal, Mahitosh Mandal, Indian Association for Cancer Research, New Delhi, (2013)


15. Content-Based Leukocyte Image Retrieval Ensembling Quaternion Fourier Transform and Gabor-wavelet Features, By Prabir Sarkar, Chandan Chakraborty, Madhumala Ghosh, 12th Int. Conf. on Intelligent Systems Design and Applications (ISDA), IEEE, Kochi, (2012)


18. Estimation of Stimulation Current For FES In Stroke Survivors Based On Surface EMG, By Debasish Maji and Soumen Das, Third International Conference on Sensors and Related Networks (SENNET’12), VIT University, Vellore, India, (2012)


44. The endometrium is the most significant contributory factor for poor outcome following ART in severe endometriosis - a study using recent technology, By Ghosh S, Chattopadhyay R, Jana S, Goswami SK, Bose G, Chakravarty M, Chaudhury K, Chakravarty BN, 28th Annual Meeting of European Society of Human Reproduction and Embryology, Istanbul, Turkey, (2012)

45. Thymoquinone alters Akt phosphorylation and mediates apoptotic induction in Human breast cancer cells, By Shashi Rajput, Mahitosh Mandal, ICSCC, New Delhi, (2012)


School of Water Resources

Head
Prof. Dhrubajyoti Sen

Assistant Professor

New Academic Programmes

The M. Tech. Programme in Water Management aims at providing integrated and interdisciplinary approaches, involving hydrological, biophysical, chemical, economic, institutional, legal, and policy-planning aspects, to solve water-related challenges in agriculture, industry, and domestic sectors. The Programme is designed for professionals and fresh graduates with Agricultural Engineering and Civil Engineering background. It aims to develop knowledge, insight and skills required to design, implement, and evaluate water management policies and strategies for making judicious use of water and achieving effective governance of water resources. The programme consists of foundation, specialization, and integration phases. The foundation phase provides latest insights, context, and concepts in integrated water and environment management issues. In the specialization phase, the students choose to make in-depth study either in Rural and Urban Water Management or Biosystems Engineering. In the integration phase, the students are challenged to bring together and apply their cumulative learning process in the form of an M. Tech. thesis.

Brief Description of on-going activities

A sponsored network project entitled "Land Use and Land Cover (LULC) Dynamics in Relation to Human Dimensions and Climate in Mahanadi River Basin, Orissa", funded by NRSC, Hyderabad, 2009-2012

A sponsored research project on “Groundwater modelling in selected basins between Farakka and Ganga Sagar” under Water Resources Management Group of Ganga River Basin Management Plan, funded by the Ministry of Environment and Forest, Govt. of India, 2010-2012

A sponsored network project entitled “Interdisciplinary network for holistic ecosystem analysis, eco-system services, integrated modelling and sustainable resources management (INNO-ASIA)”, funded by the German Federal Ministry of Education and Research (BMBF), 2010-2012

Initiated a collaborative project with the Purdue University, USA on “Multidimensional Technological Innovations for Water-linked Health and Wellness” whose host-meeting was held during March 4-6, 2013.

A research project on “Development of a 1-D Transient Conservative Pollutant Transport Model for Meso-scale Application” is sponsored by SRIC, IIT Kharagpur under ISIRD to Dr. B. Sahoo, Assistant Professor for Feb. 2013 – Jan. 2015.


The faculties associated with the School of Water Resources, Department of Civil Engineering, and Rajiv Gandhi School of Intellectual Property Law have undertaken a consultancy project entitled, “Technical Review of Current 24×7 Water Distribution Project in Mysore”, funded by JUSCO for a duration from 17th February to 30th June, 2012, amounting Rs. 39.71 lakhs.
Organized a Workshop in collaboration with the Purdue University, USA on “Multidimensional Technological Innovations for Water-linked Health and Wellness” during the First Meeting held during March 4-6, 2013

Thrust Areas

1. Integrated Water Resources Management; Supply of Equitable Water Quantity; Ensuring Minimum Acceptable Water Quality; and Regulatory and Water Governance Issues.

New Acquisitions

1. Acquisition of a Server; TDR Probe soil moisture meter; Conference Table and Chairs; Books for departmental library; Acquisition of meteorological data from IMD, Pune.

International Collaborations

Under the MOU signed between IIT Kharagpur and Leibniz University Hannover (LUH), Germany, Dr. Bala Ramani, Program Coordinator (India/South Asia), LUH has visited the School of Water Resources during February 17-18, 2012 to discuss with IIT authority for further extension of MOU period and intensification of student/faculty exchange between two institutes.

Initiated collaboration with the Purdue University, USA for taking up joint projects, faculty and student exchange program, and design of joint course curriculum during March 4-6, 2013.


Prof. Sylvia Herrmann, Leibniz University, Hannover, Germany visited the School during January 18-23, 2013 for possible research collaboration.

Dr. Didier Bellefleur, International Relation Manager (Water), ENGEES, National School for Water and Environmental Engineering, Strasbourg, France visited the School on 09.11.2012 for possible research collaboration.

Pr Dr Eric Dubreucq, Axe Chimieverte, ecotechnologies, Deptt. des Sciences pour lesAgro bioprocedes, SupAgro Montpellier 2, France visited the School on 09.11.2012 for possible research collaboration.

Dr. Christophe SODORE, Director, Office of International & Corporate relations, Paris Inst. of Technology for Life, Food and Environmental Sciences, Paris Cedex, France visited the School on 09.11.2012 for possible research collaboration.

Lectures by Visiting Experts

1. Integrated Land Management System (ILMS) for Water Management and Regional Planning by Dr. Wolfgang-Albert Flugel (Chair Professor, Hydrology & Modeling, Friedrich-Schiller University, Jena (FSU-Jena), Jena, Germany)

2. Introduction of the distributed urban storm runoff model (Tokyo Storm Runoff model) with an advanced GIS catchment delineation by Prof. Akira Kawamura (Professor & Head, Civil & Environmental Engineering, Tokyo Metropolitan University, Tokyo, Japan)

3. Predictability and Diagnostics of Western Himalayan Sutluj River flow: Spring seasonal inflow into Bhakra Dam in India by Dr. Indrani Pal (Assistant Professor, University of Colorado, Denver, USA)
**Member - Professional Bodies**

1. Sahoo, Bhabagrahi, *Life Member* - Indian Association of Hydrologists (IAH)
2. Sahoo, Bhabagrahi, *Regular Member* - American Geophysical Union (AGU)

**Sponsored Research Projects**

1. Development of a 1-D Transient Conservative Pollutant Transport Model for Meso-scale Application (ISIRD, SRIC, Rs.5.00 Lakhs)
2. INNO-ASIA networking project (Federal Ministry of Education and Research (BMBF), Germany, Rs.0.00 Lakhs)

**Books Published**


**Papers Published in Journals**


**Papers Presented in Conferences**

Vinod Gupta School of Management

**Head**
Prof. Arabinda Tripathy

**Professors**
Guin, Kalyan Kumar  
B.Tech. (IIT Kharagpur),
Mukerjee, Prithwis  
Ph.D. (Texas),
Rajib, Prabina  
Ph.D. (IIT Kharagpur), Corporate Finance, Derivatives (Financial & Commodity), Indian Capital Market
Sinha, Gautam  
Ph.D. (IIT Kharagpur),
Teltumbde, Anand

**Associate Professor**
De, Sadhan Kumar  
Ph.D. (UK),

**Assistant Professors**
Barai, Parama  
Fellow (XLRI, Jamshedpur),
Bhattacharya, Sujoy  
Ph.D. (IIIT&Mgt, Gualior), Data Analytics, Option Pricing, Quantitative Marketing
Datta, Biplab  
Ph.D. (IIT Delhi), Marketing Management, Leadership and Teamwork
Madhavan, Vinodh  
D.B.A. (USA), Credit Default Swap Indices, Long-Term Dependence, Nonlinear Time Series Analysis
Malik, Aradna  
Ph.D. (Univ of Denver), Communication Disorders, Intercultural Communication, Human Technology Interaction, Management of Public Health, Neuro Linguistic Programming (NLP)
Mallick, Sudeep  
Ph.D. (IIM Bangalore), Operations Management
Mishra, Chandra Sekhar  
Ph.D. (Utkal University), Financial Reporting and Analysis, Mergers and Acquisitions, Business Valuation, Financial Markets
Misra, Arun Kumar  
Mukhopadhyay, Susmita  
Ph.D. (Calcutta Univ.), Organizational Health and spiritual health, Human Resource Management, Business Ethics, Microfinance, Competency Mapping
Nag, Baranali  
Ph.D. (IGIDR, Mumbai), Economics of Climate Change, Energy and Environment Policy, Productivity and efficiency in industries
Pradhan, Rudra Prakash  
Ph.D. (IIT Kharagpur), Econometric Modelling, Infrastructure Finance, Financial Markets
Sahney, Sangeeta  
Ph.D. (IIT Delhi), Organizational Behavior, Marketing Management, Consumer Behavior, Services Marketing, Sales and Distribution Management, Services Quality, Quality in Education
Sarkar, Ashutosh  
Ph.D. (IIT Kharagpur),

**Visiting Facultys**
Chattopadhyay, Siddhartha  
Ph.D. (Univ. at Albany, SUNY),
Ghosh, Kunal Kanti  
M.Tech. (IIT Kharagpur), Supply chain management

**Faculty Resignation**
P. Arunprasad  
Assistant Professor
**New Academic Programmes**

Dual Degree Postgraduate programme in Financial Engineering with interested departments at IIT Kharagpur.

Launched 3-Year Executive MBA (EMBA) Programme in Kolkata and Bhubaneswar in July-September 2010.

**Brief Description of on-going activities**


**Thrust Areas**

1. Entrepreneurship
2. Financial Engineering
3. Small and Medium Enterprises
4. Process Industries

**International Collaborations**

Continuing collaboration with University of Nebraska, Omaha, and Creighton University

**Lectures by Visiting Experts**

1. General Management by Mr. Vijay Raghavan (Board of Directors, Birla Group)
2. Derivatives and Commodities by Mr. Shanmugham (Chief Economist, NCDEX)
3. Virtual World by Siddhartha Banerjee (CEO, Indus Geek Solutions)
4. Entrepreneurial plans by Rubel Ghosh (Founder & President, ERevMax)
5. IFRS by Rajiv Singh (CA, Joint technical Director, valuation & MBF course (ICAI))
6. Credit Rating vis-à-vis Risk Analysis by Sukanta Nag (General Manager, Care Ratings)
7. Positioning yourself for the future by Mr. Awdhesh Krishna (MD, Nomura India)
8. Global Retailing -- A Global Perspective by Mr. Samaresh Shah (Sales & Business Development Manager, Capgemini, India)
9. Marketing strategies and Brand Building by Mr. Anshul Asawa (GM and East India Head, HUL)
10. Managing HR in Large Organizations by Mr. Indrajit Sen Gupta (Director, Personnel Department, Andrew Yule & Company Ltd.)
11. 'New Product Development' , while taking Scooty Pep as an example by Captain Mohan Ram (Advisor, TVS Motor Company (Alumnus of IIT Kharagpur, ex naval officer))
12. Managing an Enterprise by Mr Harsh Jha (MD Tata Metaliks Ltd and the Chairman of Tata Metaliks Kubota Pipes Ltd)
13. Management involved in setting up of new steel manufacturing plants in Jharkhand and West Bengal (Shalboni) by Mr. Biswadip Gupta (MD & CEO of JSW Bengal Steel)
14. Current Challenges in Supply Chain Management by Mr. Sukanta Padhy (Supply Chain Management Head of Cummins India (Alumnus of IIT Kharagpur))
15. Customer value Management - An initiative taken by us with some of the key customers by Mr Harsh Sachdev (Chief of Marketing & Sales, Tata Bearings)
16. Data Driven Decision Making by Prof. Sudip Bhattarjee (Associate Professor ,Dept. Of Operations & Information Mgmt, School of Business, University of Connecticut)
17. Managing in the volatile, Hi Tech and Global World by Mr. R. Ravimohan (MD S&P, Head South Asia, Chairman CRISIL)
Member - Professional Bodies

1. Datta, Biplab, Regular - Council of Architecture
2. Sahney, Sangeeta, Member - Indian Society for Quality (ISQ) (Asian Network for Quality)
3. Sahney, Sangeeta, Member Category - All India Management Association
4. Pradhan, Rudra Prakash, Member - Transportation Research Group of India
5. Pradhan, Rudra Prakash, Member - International Association of Financial Engineers
6. Pradhan, Rudra Prakash, Senior Member - Regional Science Association, India
7. Pradhan, Rudra Prakash, Senior Member - Operational Research Society of India
8. Pradhan, Rudra Prakash, Member - International Project Finance Association
9. Pradhan, Rudra Prakash, Member - Sustainability Research & Policy Network
10. Pradhan, Rudra Prakash, Senior Member - Indian Econometric Society
11. Pradhan, Rudra Prakash, Member - Indian Institute of Banking & Finance
12. Pradhan, Rudra Prakash, Member - Indian Science Congress
13. Pradhan, Rudra Prakash, Member - Global Development Network
14. Pradhan, Rudra Prakash, Member - Eco-Ethic International Union, Germany
15. Pradhan, Rudra Prakash, Member - Society for Sustainable Infrastructure Development & Healthy Environment
16. Pradhan, Rudra Prakash, Senior Member - Multiple Criteria Decision Making, USA
17. Pradhan, Rudra Prakash, Member - Society for Infrastructure System
18. Pradhan, Rudra Prakash, Member - Indian Society for Probability & Statistics
19. Mishra, Chandra Sekhar, Life Member - Indian Accounting Association
20. Sarkar, Ashutosh, Life Member - Society of Operations Management
21. Sarkar, Ashutosh, Life Member - Indian Institute of Industrial Engineering
22. Sarkar, Ashutosh, Member - Production and Operations Society USA
23. Malik, Aradhna, Regular - International Communication Association
24. Malik, Aradhna, Life Member - Indian National Portage Association
25. Malik, Aradhna, Regular - Academy of Management
26. Malik, Aradhna, Member - Asian Society Against Dementia
27. Malik, Aradhna, Mentor - National Mentoring Network
29. Tripathy, Arabinda, Senior - Operational Research Society of India

Member - Editorial Board

5. Mukhopadhyay, Susmita (2009) reviewer - Psybernews
8. Nag, Barnali (0) Reviewer - International Journal of Environment and Waste Management
12. Nag, Barnali (0) Reviewer - Energy - The International Journal
13. Nag, Barnali (0) Reviewer - Energy Policy
14. Nag, Barnali (0) Reviewer - International Journal of Environmental Technology and Management
15. Pradhan, Rudra Prakash (0) Reviewer - Malaysian Journal of Economic Studies
17. Pradhan, Rudra Prakash (0) Member - International Journal of Financial Research
18. Pradhan, Rudra Prakash (0) Reviewer - African Journal of Economic and Management Studies
19. Pradhan, Rudra Prakash (0) Member - Pragyaan
20. Pradhan, Rudra Prakash (0) Reviewer - South Asia Economic Journal
21. Pradhan, Rudra Prakash (0) Member - ARASH
22. Pradhan, Rudra Prakash (0) Member - African Journal of Science and International Relations
23. Pradhan, Rudra Prakash (0) Reviewer - Energy Systems
24. Pradhan, Rudra Prakash (0) Member - International Journal of Happiness and Development
25. Pradhan, Rudra Prakash (0) Member - Journal of Management and Strategy
26. Pradhan, Rudra Prakash (0) Reviewer - Economic Modelling
27. Pradhan, Rudra Prakash (0) Reviewer - Journal of Social Sciences
28. Pradhan, Rudra Prakash (0) Reviewer - Journal of Developing Areas
29. Pradhan, Rudra Prakash (0) Reviewer - Journal of Research in International Business and Management
30. Pradhan, Rudra Prakash (0) Reviewer - Journal of Management and Business
31. Pradhan, Rudra Prakash (0) Reviewer - International Journal of Educational Research
32. Pradhan, Rudra Prakash (0) Reviewer - International Research Journal of Management and Business Studies
33. Pradhan, Rudra Prakash (0) Reviewer - International Journal of Peace and Development Studies
34. Pradhan, Rudra Prakash (0) Reviewer - International Journal of Economics and Management Sciences
35. Pradhan, Rudra Prakash (0) Reviewer - Review of Urban and Regional Development Studies
36. Pradhan, Rudra Prakash (0) Reviewer - Review of Urban and Regional Development Studies
37. Pradhan, Rudra Prakash (0) Member - Australian Journal of Business and Management Research
38. Pradhan, Rudra Prakash (0) Reviewer - Journal of Management and Technology
39. Pradhan, Rudra Prakash (0) Reviewer - Asian Economic and Financial Review
40. Pradhan, Rudra Prakash (0) Reviewer - British Journal of Economics, Management and Trade
41. Pradhan, Rudra Prakash (0) Reviewer - Journal of Social and Management Sciences
42. Pradhan, Rudra Prakash (0) Reviewer - Universal Journal of Marketing and Business Research
43. Pradhan, Rudra Prakash (0) Member - International Journal of Economics and Management Sciences
44. Pradhan, Rudra Prakash (0) Reviewer - Review of Urban and Regional Development Studies
45. Pradhan, Rudra Prakash (0) Member - Australian Journal of Business and Management Research
46. Pradhan, Rudra Prakash (0) Reviewer - Journal of Management and Technology
47. Pradhan, Rudra Prakash (0) Reviewer - Asian Economic and Financial Review
48. Pradhan, Rudra Prakash (0) Reviewer - British Journal of Economics, Management and Trade
49. Pradhan, Rudra Prakash (0) Reviewer - Arth Anvesan
50. Pradhan, Rudra Prakash (0) Reviewer - South Asian Journal of Management
52. Sahney, Sangeeta (2012) Member of Editorial Board - The International Journal of Business, Management and Social Sciences
53. Sahney, Sangeeta (2012) Member of Review Committee - Globsyn Management Journal
54. Sahney, Sangeeta (2012) Member of Review Committee - The TQM Journal
55. Sahney, Sangeeta (2012) Member of Review Committee - The International Journal of Organizational Analysis
56. Sahney, Sangeeta (2012) Member of Editorial Advisory Board - Emerald Emerging Markets Case Studies
57. Sahney, Sangeeta (2012) Member of Review Committee - Quality Assurance in Education
58. Sahney, Sangeeta (2012) Member of Review Committee - The International Journal of Business and Information

Awards & Honours

1. Madhavan, Vinodh (2010) 2009-2010 Outstanding Graduate Student Doctor of Business Administration Program, Golden Gate University, San Francisco
2. Pradhan, Rudra Prakash () BEST PROFESSOR IN INFRASTRUCTURE FINANCE
3. Datta, Biplab (1992) Institute Silver Medal
5. Datta, Biplab (1985) SAIL Merit Scholarship
6. Pradhan, Rudra Prakash () SAP FELLOW
7. Mukhopadhyay, Susmita () University Gold Medal for topper in MSC 1997

**Sponsored Research Projects**

1. A Comparative Assessment of Performance of Select Institutes of Higher Education. (Indian Council of Social Science Research, ICSSR, Rs.4.86 Lakhs)
2. Econometric Modelling on Data Analysis (, Rs.5.00 Lakhs)
3. Econometric Modelling on Time Series (, Rs.2.50 Lakhs)
4. Money management Issues and Practices of the Ultra Poor Populations in West Bengal (ISIRD, Rs.0.00 Lakhs)
5. Risk Management in Supply Chain: A Study from the Perspective of Indian Industry (ISIRD, IIT Kharagpur, Rs.5.00 Lakhs)
6. Socio Economic Development in India (, Rs.0.00 Lakhs)

**Consultancy Projects**

1. Delay analysis of 2nd Phase Expansion of NALCO’s Alumina Refinery (NALCO, Rs.0.00 Lakhs)
2. Operations Gurukul Workshop (Tata Management Training Centre [TMTC] Pune, Rs.3.00 Lakhs)
3. Performance Evaluation of Continuous Surface Miner at Panchpatmali Bauxite Mines (NALCO, Rs.0.00 Lakhs)
4. Project Management for Coal India Executives (Indian Institute of Coal Management [IICM], Ranchi, Rs.2.50 Lakhs)
5. Project Management Module for Voltas Executives (Tata Management Training Centre [TMTC] Pune, Rs.1.50 Lakhs)

**Visits Abroad by Faculty Members**

1. Pradhan, Rudra Prakash - Conference (UK, ) 2012
2. Pradhan, Rudra Prakash - Conference (Canada, ) 2012
3. Sarkar, Ashutosh - Collaborative Research (Center for Logistics & Supply Chain Management, Faculty of Business, Statistics and Economics, University of Vienna, ) 54 days

**Books Published**

1. Dr Amita, Dr D Acharya,Dr I RoyChowdhury,Dr lakshmi Kumar, Dr S Mukhopadhyay, Dr Veerashekharappa: EFFECT OF RESERVE BANK OF INDIA REGULATIONS ON PUBLIC SECTOR LENDING FOR MICROFINANCE INSTITUTIONS published by IFMR Chennai (2012)
2. Dr. Amita Dharmadhikary-Yadwabkar, Dr. Lakshmi Kumar, Dr. Mani Nandhi, Dr. Susmita Mukhopadhyay, Dr.: RETHINKING RESERVE BANK OF INDIA (RBI) REGULATIONS FOR MFIS AN ANALYSIS OF MICROFINANCE CLIENTS FROM URBAN AND SEMI-URBAN COMMUNITIES published by IFMR Chennai (2013)

**Short-Term Courses, Training Programmes and Workshops organised**

1. Advanced Management Programme for Executives from Mining Industry (February 18-22, 2012)
2. AICTE Approved Short Term Course. Title: “Consumer Behavior: Role Of Market Research” (Five days. 21st May, 2012 – 25th May, 2012)
3. Development Programme for E-2 & E-3 Executives of Uranium Corporation of India Limited (March 31-April2, 2011)
**Papers Published in Journals**

1. A case study on the ethical issues in MFIs  *By* Saswat Barpanda and Susmita Mukhopadhyay  *Journal of Business Ethics in Developing Economies*  Vol 1  (2013)

**Papers Presented in Conferences**

Advanced Technology Development Centre

**Head**
Prof. S. DasGupta.

**Associated Faculty**

<table>
<thead>
<tr>
<th>Faculty Name</th>
<th>Department/Program</th>
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<tbody>
<tr>
<td>Prof. S. DasGupta, ChE</td>
<td>Microscale Transport Process and Microfluidics</td>
</tr>
<tr>
<td>Prof. P.P. Chakrabarti, CSE</td>
<td>Artificial Intelligence, CAD for VLSI Design of Algorithms, Formal Verification</td>
</tr>
<tr>
<td>Prof. S.K. Lahiri, Advisor SRIC</td>
<td>Microelectronics, VLSI, MEMS, Integrated optics</td>
</tr>
<tr>
<td>Prof. S.K. Sen, Advisor SRIC</td>
<td>Advanced Plant Genetics.</td>
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<tr>
<td>Prof. S. Sengupta, E &amp; ECE</td>
<td>Computer vision, Multimedia</td>
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<tr>
<td>Prof. D. Biswas, E &amp; ECE</td>
<td>III-V Semiconductor Device Technology</td>
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<tr>
<td>Prof. A. Patra, EE</td>
<td>VLSI Design of Power Converters, Industrial Information Technology</td>
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<tr>
<td>Prof. A. Basu, CSE</td>
<td>Embedded Systems, Artificial Intelligence application</td>
</tr>
<tr>
<td>Prof. S. K. Roy, Physics</td>
<td>Solid State Physics, thin film, nanotechnology</td>
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<tr>
<td>Prof. S. P. Pal, CSE</td>
<td>Computational geometry, Design and analysis of algorithms</td>
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<tr>
<td>Prof. B. Bhattacharya, CE</td>
<td>Structural Engineering, Reliability</td>
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<td>Prof. A. Ghosh, BT</td>
<td>Virology and Molecular Biology</td>
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<tr>
<td>Prof. Pallab Dasgupta, CSE</td>
<td>VLSI CAD &amp; Electronic Design Automation</td>
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<tr>
<td>Prof. S. Chakraborty, ME</td>
<td>Micro fluids</td>
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<tr>
<td>Prof. R. Banerjee, AFE</td>
<td>Food Biotechnology, Bioenergy, Enzymology and its biotechnological applications, Protein chemistry.</td>
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<tr>
<td>Prof. S. Mukhopadhyay, EE</td>
<td>Failure Diagnostics and Prognostics and Tolerance for Vehicular Systems, Industrial Instrumentation and Control and Automation.</td>
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<tr>
<td>Prof. P.K. Chattaraj, Chem</td>
<td>Density functional theory, Chemical reactivity, ab initio calculations, Quantum chaos, Aromaticity in metal clusters.</td>
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<tr>
<td>Dr. T.K.Bhattacharyya, E &amp; ECE</td>
<td>Microelectronics, VLSI, MEMS</td>
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<tr>
<td>Dr. S. Das, SMST &amp; ATDC</td>
<td>Microsystems Technology, BIOMEMS, Electro-physiological characterisation of biospecies, Medical electronics.</td>
</tr>
<tr>
<td>Dr. Chacko Jacob, Mat. Sc.</td>
<td>Wide Bandgap Semiconductors/ Nanomaterials/ Direct Fluorination of Materials/Oxide semiconductors</td>
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<tr>
<td>Dr. Pallab Banerjee, Mat. Sc.</td>
<td>Semiconducting materials, Materials for energy conversion: Photovoltaic and Thermoelectric, III-V and II-VI MOCVD, Organic semiconductor</td>
</tr>
<tr>
<td>Dr. A. Dhar, Physics</td>
<td>Condensed matter Physics, nanotechnology</td>
</tr>
<tr>
<td>Dr. Pranabendu Gangopadhyay</td>
<td>Microphotronics, Integrated Optics, Fiber Optics, MOEMS.</td>
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**LABORATORIES / CENTRES INVOLVED IN ATDC**

a) MEMS and Microelectronics Laboratory  
b) MEMS Design Centre  
c) Micro-fluidics Laboratory  
d) Microphotronics Laboratory  
e) Microscience Laboratory  
f) Advanced VLSI Laboratory
Brief descriptions of on-going activities

Micromachining and MEMS are one of the major areas of research at Advanced Technology Development Centre. In addition to that, the fabrication of silicon and non silicon based microelectronic devices and ICs are also focused area of research at different laboratories under ATDC. Several government departments including NPSM/ADA, ISRO, DRDO, DST and BARC have funded projects to develop microsensors for special applications. During the last one year the MEMS devices developed in the laboratory include silicon piezoresistive accelerometer and microthruster and flow sensors. The technology for fabrication of silicon accelerometer has been transferred to Semiconductor Complex Limited, Chandigarh. Activities have been started on development of high sensitive MEMS accelerometer based on quantum tunneling phenomena and silicon MEMS pressure sensor. Design and development of MEMS based micropulsion devices for micro/nano satellite programme such as Microthruster, Microvalve and Micropump.

The MEMS design laboratory, a national facility created under NPSM programme is actively involved with design work on MEMS including microfluidic devices. A number of students from various departments like ATDC, E & ECE, Electrical, Mechanical, Biotechnology, Material Science Department / Centre are involved in the Design Centre to do their project / thesis works. Other academic Institutions like Jadavpur University and CMERI, Durgapur, are also involved in the Design Centre.

Research and development is also undertaken in the field of Integrated Optics & Micro-Photonics. An integrated-optic design software have been developed and copyrighted. This software can design single-mode step-index and graded index waveguides along with bending losses and mode profiles. Fabrication and characterization of titanium indiffused lithium niobate waveguides, directional couplers, power splitters, switches for fiber-optic communication networks have been performed. Recently polymer based microstructures for microphotonic applications have been developed in the centre. Polymer integrated-optic waveguides have been fabricated and characterized in the centre for possible applications in passive devices.

Research is being carried out on thin film nanostructures, semiconductor, ferroelectric and magnetoresistive films for microelectronics and sensor applications under various government sponsored projects at MicroScience Laboratory of Dept. of Physics & Meteorology. A number of thrust areas have now emerged based on core competency available in the Advanced VLSI Laboratory. These include analog and RF circuits, wireless communication and Baseband processing, direct conversion receivers, power management circuits, processors and IP cores for embedded applications and design for testability. More than 60 different chips have been fabricated and tested. 15 leading companies have joined the AVLSI Consortium. More than 12 ongoing collaborative research projects funded by the Govt. of India and leading companies including National Semiconductors, Intel, Synopsys, Infineon, Texas Instruments, Si2 Microsystems, Agilent, Tessolve, Analog Devices and General Motors. The laboratory also offers regular intensive training to students of IIT Kharagpur. Buoyed by these initial successes, the laboratory is striving to attain still higher levels of excellence. Research directions are diversifying to new areas of mixed-signal SOCs, IP cores for embedded applications and analog DFT. Existing expertise on formal verification and optimization methods is being applied to design verification, synthesis and CAD Tool development for the deep sub-micron processes. More than fifty Doctoral and Masters students are working on various emerging areas. The Centre for Theoretical Studies (CTS) is primarily engaged to generate and nucleate theoretical research on fundamental aspects of basic and engineering sciences.

The Advanced Laboratory for Plant Genetic Engineering is dedicated to develop technologies suitable to enhance the productivity potential of some of our major crop plants through biotechnological
approach. The laboratory has met with some success in identifying specific genetic elements associated with fiber development in jute stem through functional genomic approach. Additionally, attempts to map the individual seven linkage groups of jute are underway. Discovery of certain plant genes and regulatory elements involved in the metabolic pathway of fatty acid synthesis and modification of their functional role in case of synthesis of seed oil of Indian mustard (Brassica juncea), are in active state of pursuit. Additionally, attempts have been initiated to genetically tamper the lignin biosynthetic pathway in vegetative parts of jute and sorghum plants by anti-sense approach. Major attempts have also been made in strategy development for generation of genetically modified crop plants resistant against insect pests belonging to lepidoptera, coleoptera and homoptera. Some success could be attained in case of cotton, Brassica and rice. Discovery of novel insecticidal genes from plants and bacteria and generation of transgenic crop plants expressing these insecticidal genes have been accomplished. Attention has also been directed towards development of efficient transformation methods for certain recalcitrant crop plants that have not yet been accessible to gene transfer methodologies. Further, development of marker free transgenic plant generation and site-specific integration of transferred DNA have figured as major targets of activities in order to enhance the efficacies of gene transfer techniques to a great height. The laboratory has also developed a microbial bioprocess technology using the state of the art of bio-film technology for high through-put production of superior quality of jute fibers. The technique reduces production time by ~70% and results significantly low effluents and greenhouse gases. The process thus developed is safe for human handling and offers excellent quality control ensuing at least 2-3 grades better fiber quality against methods that are in use by the jute growers. Further, attempts to explore the possibilities for generation of jute fiber based bio-composites have also been initiated. The laboratory is further working on microbial bio-film based technology for high through-put production of specific carbohydrate macerating enzymes that carries industrial significance.

## Thrust Areas


## New Acquisitions

MEMS vaporising liquid microthruster, Microflow for microvalve, micropump, MEMS flow sensors, SU8 Optical Waveguides, MEMS accelerometer for aircraft motion sensing. Tunneling accelerometer and Capacitive accelerometer, SU-8 smart microneedles.

## ON-GOING RESEARCH PROJECTS

### Sponsored Projects

<table>
<thead>
<tr>
<th>SL. No.</th>
<th>Title of the project</th>
<th>Sponsor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Indo-US Joint Centre on Advanced and Futuristic Manufacturing</td>
<td>Indo-US Science &amp; Technology Forum,</td>
</tr>
<tr>
<td>2</td>
<td>Development of Silicon Microsensors for Flow Measurement</td>
<td>MHRD</td>
</tr>
<tr>
<td>3</td>
<td>Design, analysis and optimization of navigation grade silicon based MEMS accelerometer</td>
<td>ISRO-KCSTC cell</td>
</tr>
<tr>
<td>4</td>
<td>Upgrading facilities for MEMS design activities at national resource centre</td>
<td>NPMASS, ADA, Bangalore</td>
</tr>
<tr>
<td>5</td>
<td>Development of MEMS based components for RF applications</td>
<td>NPMASS, ADA</td>
</tr>
<tr>
<td>6</td>
<td>Development of MEMS based accelerometers for Aerospace applications</td>
<td>NPMASS, ADA</td>
</tr>
<tr>
<td>7</td>
<td>MEMS based micro-propulsion devices for micro-satellite programme</td>
<td>ISRO</td>
</tr>
<tr>
<td>8</td>
<td>Multi-scale modeling to study the role of atomic scale defects in CNT-based nanocomposites</td>
<td>DST</td>
</tr>
<tr>
<td>9</td>
<td>Effects of non-linearity and viscoelasticity of blood and wall tissues and magnetohydrodynamic effects on the flow field</td>
<td>CSIR, New Delhi</td>
</tr>
<tr>
<td>ID</td>
<td>Project Description</td>
<td>Sponsor/Contributor</td>
</tr>
<tr>
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<tr>
<td>4</td>
<td>Kinematics of flows in normal and pathological states (ENV)</td>
<td>DST, New Delhi</td>
</tr>
<tr>
<td>10</td>
<td>Kinematics of flows in diverse contexts (KFD)</td>
<td>DST, New Delhi</td>
</tr>
<tr>
<td>11</td>
<td>Measuring the HI power spectrum with the GMRT (MRT)</td>
<td>BRNS, DAE, Mumbai</td>
</tr>
<tr>
<td>12</td>
<td>Targeted gene integration in rice and cotton</td>
<td>National Fund for Basic Science, ICAR</td>
</tr>
<tr>
<td>13</td>
<td>Establishment of independence of Linkage Groups of jute through trisomic analysis in order to construct the genetical and physical map of jute genome.</td>
<td>DBT</td>
</tr>
<tr>
<td>14</td>
<td>Application of technology for tomato hybrid seed industry involving rural women for employment and income generation</td>
<td>DST</td>
</tr>
<tr>
<td>15</td>
<td>Recombinant DNA for development of a male-sterility system in jute.</td>
<td>DBT</td>
</tr>
<tr>
<td>16</td>
<td>Generation and cataloguing of bast fibre developmental stage specific EST library from jute</td>
<td>DBT</td>
</tr>
<tr>
<td>17</td>
<td>Design and fabrication of high sensitivity micro machined silicon tunneling accelerometer with micro-g resolution</td>
<td>ISRO</td>
</tr>
<tr>
<td>18</td>
<td>Development &amp; characterization of nanostructured thin films for SiGe quantum well infrared photodetector and ferroelectric based gas/chemical sensors</td>
<td>DRDO</td>
</tr>
<tr>
<td>19</td>
<td>Terahertz emission of Si/SiGe structures doped with shallow acceptors</td>
<td>DST</td>
</tr>
<tr>
<td>20</td>
<td>Synthesis and characterization of nanostructured materials for functional and structural applications</td>
<td>DST</td>
</tr>
<tr>
<td>21</td>
<td>Fabrication and characterization of Novel Photonic Crystal Structures and SiGe Quantum Dots for Photonic Applications</td>
<td>DST-ITPAR, Italy</td>
</tr>
<tr>
<td>22</td>
<td>Design, analysis and optimization of navigation grade silicon based MEMS accelerometer</td>
<td>ISRO-KCSTC</td>
</tr>
<tr>
<td>23</td>
<td>Medical image analysis and MEMS based flow sensor development</td>
<td>Texas Instruments</td>
</tr>
<tr>
<td>24</td>
<td>Feasibility study of MEMS based biochip platform for characterisation of biospecies</td>
<td>IIT Kharagpur</td>
</tr>
<tr>
<td>25</td>
<td>Effects of non-linearity and viscoelasticity of blood and wall tissues and magnetohydrodynamic effects on the flow field in arteries in normal and pathological states (ENV)</td>
<td>CSIR, New Delhi</td>
</tr>
<tr>
<td>26</td>
<td>Kinematics of flows in diverse contexts (KFD)</td>
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<tr>
<td>27</td>
<td>Measuring the HI power spectrum with the GMRT (MRT)</td>
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</tr>
<tr>
<td>28</td>
<td>All India Coordinated Research Project on Post Harvest Technology</td>
<td>ICAR, New Delhi</td>
</tr>
<tr>
<td>29</td>
<td>A Value Chain on Aloe Vera Processing</td>
<td>ICAR, New Delhi</td>
</tr>
<tr>
<td>30</td>
<td>Development of Silicon Carbide Thin Films for High Temperature and High Power Devices</td>
<td>DRDO</td>
</tr>
<tr>
<td>31</td>
<td>All India Coordinated Research Project on Post Harvest Technology</td>
<td>ICAR, New Delhi</td>
</tr>
<tr>
<td>32</td>
<td>Development of a MEMS based assay for biomedical diagnostics.</td>
<td>ISRO-IIT Kharagpur Cell</td>
</tr>
<tr>
<td>33</td>
<td>Development of SU-8 based microstructures for Integrated-Optic and Bio-applications</td>
<td>ISIRD, SRIC, IIT Kharagpur</td>
</tr>
<tr>
<td>34</td>
<td>Synthesis of functional groups for immobilization of functional proteins on MEMS based micro-sensor surfaces</td>
<td>Indo-Trento Program for Advanced Research</td>
</tr>
<tr>
<td>35</td>
<td>Upgrading Facilities for MEMS design activities at National resource centre.</td>
<td>NPMASS, ADA, Bangalore,</td>
</tr>
<tr>
<td>36</td>
<td>AVLSI Consortium</td>
<td>Multiple Industrial Organisation</td>
</tr>
<tr>
<td>37</td>
<td>Separation and electrical characterization biological cells using microfluidic devices.</td>
<td>Sponsored by NPMASS, ADA, Bangalore,</td>
</tr>
</tbody>
</table>
Droplet based microfluidics for electronics cooling. Intel Corporation.


A study of Microscale transport processes leading to the development of a cooling strategy for electronic components. Department of Information Technology

Development of low cost household filter for arsenic and other pollutant free drinking water using modified laterite. Department of Science and Technology

Rapid DNA hybridization in microfluidic channels. DBT

Droplet based screening of Amyloid β-peptide aggregation DBT

Consultancy Projects

<table>
<thead>
<tr>
<th>SL. No.</th>
<th>Title of the project</th>
<th>Sponsor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Development and realization of high Q-factor quartz double ended tuning forks using micromachining technology</td>
<td>ISRO-IISU</td>
</tr>
<tr>
<td>2.</td>
<td>Development of ADC and Receiver for wireless applications</td>
<td>Si2 Microsystems</td>
</tr>
<tr>
<td>3.</td>
<td>Design of RFIC modules</td>
<td>National Semiconductor Corporation, USA</td>
</tr>
<tr>
<td>4.</td>
<td>Design and processing of MEMS microstructure for mechanical property evolution</td>
<td>DMRL, Hyderabad</td>
</tr>
<tr>
<td>5.</td>
<td>Thin Film Characterization</td>
<td>Various agencies</td>
</tr>
</tbody>
</table>

New M. Tech. Course

Apart from Ph.D. and M.S. degrees the centre has started a new M. Tech. course on embedded control and software (ECS). The course covers Design, Analysis and Implementation of high quality, functionally accurate embedded software incorporating complex intelligent control mechanisms across a wide range of hardware and software platforms. The methods address issues to Performance, Power / Energy, Fault Tolerance, Real-Time Operations, Safety-Criticality, Communication, Security, Parallel / Distributed Implementations, Software Engineering, etc. It will incorporate important applications, development of CAD tools and include Laboratory and Industry experience. The course is Interdisciplinary and Collaborative in nature and faculty members from several departments along with industry and other external experts are taking classes. It includes possibilities of industry based projects, sponsored candidates and participation in national level programmes. Research-orientation is a focus of this course which aims at developing new methods of intelligent control and software technology.

RESEARCH PUBLICATIONS

Research publications of associated faculty are listed in their corresponding departmental pages.

FACILITIES NEW ADDITION

Vacuum Probe Station.
Semiconductor parameter analyzer and Probe station interface using Labview setup.
Network Analyzer.
High Precision LCR Meter.
Wire Bonder.
Diffusion Furnace.
Nano Enabler for Bio-Assay Preparation.
Bio Safety Cabinet.
UV Ozonizer for Surface Oxidation.
Precision Crystal Cutter.
Vibration free Optical bread-board table.
COLLABORATIVE EFFORTS

• A joint collaboration research project on "Development of micromechanical inertial and flow sensors for environmental / biomedical application" sponsored by DST, Govt. of India in going on under an Indo-Italian research programme. (ITPAR). Collaborating Institute - ITC - irst. Trento, Italy.
• A Proposal on "Indo - US centre for advanced and futuristic manufacturing" has been submitted by IIT Kharagpur to Indo -US Science and Technology forum. Under this proposal Advanced Technology Development Centre, IIT Kharagpur will be a partner institution.
• A joint collaborative research on "UV-written waveguides and microstructures on lithium niobate" is going on with Optoelectronics Research Centre, University of Southampton, U.K.
Alumni Affairs and International Relations

Dean of Alumni Affairs & International Relations
Prof. Amit Patra, Electrical Engineering

Managing Director, Institutional Development Program
Chinna Boddipalli,

Standing Committee on Alumni Affairs & International Relations:

Dean (P & C) and Professor-In-Charge of Information Cell
Prof. B.K. Mathur, Physics

Professor-In-Charge of News Letters / Publications
Prof. Joy Sen, Architecture & Regional Planning - Chief Editor

Technology Alumni Association Secretariat
Late Prof. Goutam Bandyopadhyay, Aerospace Engineering - President
Dr. Dilip K. Nanda, Computer Informatics Centre-Secretary
Prof. Kajal Biswas, Mechanical Engineering-Joint Secretary
Prof. Joy Sen, Architecture & Regional Planning-Treasurer

Office of AA & IR
Shampa Goswami – Technical Superintendent
Shreyoshi Ghosh – Institutional Development Executive
Shruti Gupta - Institutional Development Executive
Anupam Sarkar - Institutional Development Executive

Institutional Development (ID) Program
IIT Kharagpur has initiated the Institutional Development (ID) program to leverage the alumni and corporate relations to support the all-round development of the Institute. Approved by the Board of Governors on February 20, 2010, the program was formally launched on July 1, 2010 with the recruitment of the Managing Director of the program, Mr. Chinna Boddipalli (’72, AE).

Mission
The program aims to support institute’s offer to enhance its international ranking.

Vision
• Provide support for all-round growth plans of the Institute
• Implement a Sustainable and scalable resource development program
• Leverage the alumni and corporate relations for the growth of the Institute
• Promote the KGP Brand

Key components of the program:
• Alum connectivity
• Sustainable Fundraising
• Industrial Collaborations
• KGP brand building
• Recruitment and Retaining

The various activities of the Office of Alumni Affairs & International Relations under the banner of ID Program over the past one year are as follows:
Present Activities and Achievements

Alum Connectivity

Portal Migration
1. Content and database migrated successfully to Eklavya Creations, Development activities work-in-progress.
2. Separate content management system has been developed for offline content development. Video upload has been made possible.
3. The website is now offering secured directory service through emailing facility. Alumni can now network with each other through the email option made available wherein an alumnus can send email to a registered user’s email id without the email id getting disclosed.
4. The portal has also proved to be an effective tool to accept donations campaign wise from alumni and generate receipt immediately. Pledges for donation can also be made through the website. Faculty registration facility has been made available.

KGP Connection
1. This is a fortnightly e-newsletter providing a platform to news and information related IIT-KGP students, alumni and faculty.
2. The monthly registrations at the web portal www.iitkgp.org increases substantially as and when the newsletter is mailed out.
3. The email database had 6000 email contacts initially and has increased to a figure of 32000.

Social Media Engagement
1. Facebook group has been created and has over 1500 members. It is being used for networking and promotions.
2. LinkedIn is being actively used for networking. It has over 11000 members.
3. Yahoo groups are also being approached.
4. Twitter account and YouTube Channel have been created.
5. 15000 alumni including faculty and students are connected via social media.

Email Service – Mass mailing service has been opted with new organization with customized mailing and specific reports generation. This service connects with alumni registered with us and also those whose email contacts are available with us.

Publications
1. Annual and quarterly print publications help exchange of news and stories to and fro alumni, students and faculty. Among these the key one is KGPian.
2. The Alumni Annual Report is the initiative of ID Program which maintains accountability and also shares information about fundraising initiatives, donors and its beneficiaries, new projects in the Institute etc. It gives donation details of IIT Foundation US as well.

Database Management: This has two aspects –

CRM
1. Development activities are work-in-progress; integration is done with website
2. Special modules developed for entering and tracking donation, receipts and pledge details. Database will be managed through CRM entirely.
3. Donor status, awards etc. have been linked to individual alumni profile.
4. Integration with email server is pending to help avail campaign mailing service through CRM

Data mining
1. Overall 30000 individuals are connected with via various interfaces – email, social media platforms and phone. This includes alumni, faculty and students.
2. 60 years database, convocation as well as contact details are being verified from old convocation brochures, online search and all available interfaces.
3. Departments are contacted for collecting alumni and faculty data. Students’ data collected from ERP section.
Fundraising Campaigns

Under ID Program, several fund raising campaigns have been formulated –

1. **Founding Endowment Batch campaign – Grass-roots campaigning** have been tremendously successful with ID Program gearing up for fundraising; while it was a few lakhs in the past 60 decades, in one year the amount has crossed the figure of INR 3 crores. The Founding Endowment Batch campaign is for alumni across all the batches to donate for their respective batches and a classroom when they reach the minimum target of INR 50 lakhs. Batch Leaders are being identified and communicated accordingly to encourage them to network with their batchmates and promote the campaign. This campaign has been successfully led by the 1991 batch that has already reached the initial target of INR 50 lakhs and got a classroom named after them. Other batches are also in the process of becoming Founding Endowment Batches. Promotion of this campaign is being done through personal contact, group meeting, events, mass mailing, customized mailing, social media and peer group motivation.

2. **My Imprint Campaign** – This campaign is for passing out students to contribute their caution money for becoming Founding Endowment Batch and also pledge a small percentage of their annual income. This campaign was fully launched in the year 2012 with 500 students signing up for the campaign. This novel initiative was reported in media as well as the youngest alumni donating their caution money and pledging.

3. **Parents Campaign** – This was launched before convocation 2012 requesting parents to donate. Contact has been established with parents on festive occasions to make them engage with the Institute

4. **Specific Endowment Programs** – Endowments for Chair Professorship, Young Faculty Award and Scholarship are being promoted as per requirement of the Institute or on special request of the alumni

**Branding:**

1. **Public Relations (PR):** News items are being made available to the media at regular intervals through print, electronic and online. List of media houses and PR sites across the country have been created and rapport are being developed to ease disbursement of news and information. Event and need based PR activities are being done successfully since the launch of ID Program and is considered as a thrust area under its KGP Branding initiative.

2. **Students’ PR Cell:** This student body has been set-up to support the entire gamut of PR activities and make the Institute website dynamic and informative. This cell will work under the guidance of ID Program PR initiatives and will support the same.

3. **Ranking:** Initiatives are being taken to improve the international as well as domestic ranking of the Institute. The ranking parameters and procedures are being studied and strategic decisions need to taken based on the research. Data is being submitted annually for domestic and international ranking. Analysis report is being made suggesting scope of improvement The Institute has featured the first time in Times HE ranking and has been noted as the top most higher educational institution in India

**Recruitment and Retaining of Faculty and Students:**

1. Initiatives have been taken to collect data pertaining to Adjunct Faculty from among alumni and also maintaining track of all academic and industrial visitor profiles.
2. Peer data collection is a key initiative.
3. Awards are being initiated to attract and retain young faculty while Chairs are constituted to attract world-class faculty.
4. On the students front branding and networking by current students is an important initiative.
R&D: Certain corporate houses have been approached but the entire activity requires different logistics and organization and it is best to be addressed by Vision 2020. ID program will provide the necessary support as and when required.

Foundation Day – The office of the Dean organizes events on the occasion of the Foundation Day of the Institute. The 62nd Foundation Day was celebrated on August 18, 2012. The event was graced by alumnus Dharam Vir IAS (Retired), State Election Commissioner, Haryana.

Distinguished Alumnus Award 2012

Dr. P. C. Varghese (61/PhD/CE)
Prof. Viswanatha Ramamurti (63/MTech/ME/GH)
Prof. Sanjoy Banerjee (65/BTech/ChE)
Prof. Farrokh Mistree (67/BTech/NA/Azad)
Prof. Subrata Sengupta (69/BTech/ME/NH)
Prof. Dipankar Raychaudhuri (76/BTech/ECE/Patel)
Prof. Pinakpani Chakrabarti (76/MSc/Chem)
Mr. V. P. Sandlas (67/BTech/ECE/VS)
Mr. Sandipan Chakravortty (70/BTech/ME/RK)
Dr. Supratik Guha (85/BTech/Met/RP)
Dr. Anand Deshpande (84/BTech/CSE/Patel)
Mr. Pronob Kumar Sandell (55/BTech/ME)

Institute Lecture Series

Speaker: Prof. Chun-Yen Chang, President Emeritus, National Chiao Tung University, Taiwan

Speaker: Dr. Supratik Guha, Director, Physical Sciences Department, IBM Thomas J. Watson Research Center, New York, USA
Topic: “Energy efficient computing technologies towards the end of and beyond silicon scaling”

Speaker: Prof. Christian Rohde, Chair of Applied Mathematics, Institute of Applied Analysis & Numerical Simulation, University of Stuttgart, Germany
Topic: “A trip through fluidic interfaces in compressible fluid flow: shock waves, contact waves and phase transitions”

Speaker: Dr. Ajoy Banerjee, President, BIYA Global Inc., USA
Topic: “Construction, operation and management of Electric Power Plants”

Speaker: Prof. C. Raj Kumar, Vice Chancellor, O P Jindal Global University, Haryana
Topic: “Disaster Management and Governance”

Some of the recent visits of alumni are as follows:

- Mr. Rajesh Pandey, IAS, Chairman and MD, West Bengal State Electricity Distribution Co. Ltd., visited IIT Kharagpur on 13th April 2012 to deliver a guest lecture on ‘Careers in Indian Civil Service’ for the students.

- Dr. Lim Siow Jin, CEO, DXN Holdings, a Malaysia based MNC, visited IIT Kharagpur on 20th April 2012 for some scientific discussions.

- Mr. Vijay Varki and Mr. Mukul Mitra, visited the Institute during 20-22 June 2012 for Amphitheatre project and renovation of TOAT.
Mr. Dharam Vir, State Election Commissioner, Haryana, visited the Institute on 18\textsuperscript{th} August 2012 to deliver the Foundation Day Lecture as Chief Guest and to receive the Distinguished Service Award 2011.

Dr. Supratik Guha, Director, Physical Sciences Department, IBM Thomas J. Watson Research Center, USA, visited the Institute on 24\textsuperscript{th} August 2012 to deliver an Institute lecture.

Dr. Ajoy Banerjee, President, BIYA Global Inc., USA, visited the Institute on 3rd January 2013 to deliver an Institute lecture.

Prof. Subrata Sengupta, University of Michigan, USA, visited the Institute during 4-6 January 2013 to receive the Distinguished Alumnus Award 2012.

Dr. Prabhakant Sinha attended the International Conference on “New Horizons in Bioenergy Research” at the Institute during January 14-16, 2013

Details of Distinguished Visitors during the period 2012-2013

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name &amp; Details of Visitors</th>
<th>Date of Visit</th>
<th>Purpose of Visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mr. Anshuman Mishra Sr. Consultant, KPMG India</td>
<td>8\textsuperscript{th} August 2012</td>
<td>Delivered a lecture to the students on Careers in Consulting</td>
</tr>
<tr>
<td>2</td>
<td>Dr. Peter Gevorkian, President / CEO, Vector Delta Design Group, Inc. Mr. Subhasish Mitra, Chairman, Pelican Group Mr. Rathindra Mohon Datta, Director, Pelican Group Mr. Arunava Barua, Vice President, Pelican Group.</td>
<td>20\textsuperscript{th} November 2012</td>
<td>For establishing academic / collaborative relationship</td>
</tr>
<tr>
<td>3</td>
<td>Prof. Chris Somerville, Advisor of P K Sinha Centre for Bioenergy</td>
<td>14-17 January 2013</td>
<td>Attended the International Conference on “New Horizons in Bioenergy Research” at the Institute</td>
</tr>
<tr>
<td>4</td>
<td>Prof. C Raj Kumar, Vice Chancellor O.P. Jindal Global University, Haryana</td>
<td>12\textsuperscript{th} February 2013</td>
<td>To deliver an Institute lecture on &quot;Disaster Management and Governance&quot;</td>
</tr>
<tr>
<td>5</td>
<td>Prof. Marie-Louise Klotz and Prof. Gautam Saha, Rhein-Waal University</td>
<td>27\textsuperscript{th} February 2013</td>
<td>For signing the MoU</td>
</tr>
</tbody>
</table>

The Institute signed the following MoUs during the period April 2012 - March 2013

i) University of New South Wales, Australia (signed on 13\textsuperscript{th} April 2012)

ii) Renewal of agreement with The Universite Lille, France and its Graduate School of Engineering, Polytech Lille (signed on 16\textsuperscript{th} April 2012)

iii) Govt. of Chhattisgarh for creation of Extension Centre of IIT Kharagpur at Raipur (signed on 17\textsuperscript{th} April 2012)

iv) Joining and Welding Research Institute, University of Osaka, Japan (signed on 20\textsuperscript{th} September 2012)

v) Membership agreement with the United Nations University, Japan (signed on 24\textsuperscript{th} September 2012)
As per MoU, the Institute permitted the following students to undergo the academic courses/internship at IIT Kharagpur during April 2012 – March 2013:

<table>
<thead>
<tr>
<th>Name of the University</th>
<th>Name of the student (s)</th>
<th>Duration of visit</th>
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<tr>
<td>Polytech Lille, France</td>
<td>Ms. Fanny Tissot</td>
<td>Dept. of Agricultural &amp; Food Engineering</td>
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<tr>
<td>University of California, Berkeley</td>
<td>Ms. Katherine He</td>
<td>Dept. of Chemical Engineering &amp; Dept. of Electrical Engineering</td>
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<td></td>
<td>Ms. Ramya Prathuri</td>
<td>16.06.2012 – 12.08.2012</td>
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<td></td>
<td>Ms. Akshita Dutta</td>
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<td>Mr. Jay Patel</td>
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<td>Mr. Rohan Jonnalagadda</td>
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<tr>
<td>Technische Universitat, Darmstadt, Germany</td>
<td>Ms. Judith Elin Vesper</td>
<td>Dept. of Mechanical Engineering</td>
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<tr>
<td>Leibniz University, Hannover, Germany</td>
<td>Mr. Tim Federmann</td>
<td>Dept. of Architecture &amp; Regional Planning</td>
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<td>August 2012 – July 2013</td>
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<tr>
<td>Virginia Commonwealth University, USA</td>
<td>Mr. Demetrius Adams</td>
<td>06.01.2013 – 11.01.2013</td>
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<td>Mr. Joshua Monday</td>
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<td>Mr. David Tchao</td>
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<td>Ms. Abigail McFarland</td>
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The Central Library, IIT Kharagpur is one of the largest technological libraries in Asia which is fully automated and facilitates more than 10,000 users from students, research scholars, faculty and staff of the Institute. Its website address is http://www.library.iitkgp.ernet.in

**Chairman**

Professor S. Chattopadhyay  
Ph. D (IIT Kharagpur), MURP (SPA Delhi), B. Arch (Calcutta), Cert, Housing (Newcastle, UK), Dip, Housing (Lund, Sweden), AITP, Housing, Urban Planning and Building Materials.

**Librarian**

Sutradhar, B.  
Ph.D., M.Sc., M.Lib.I Sc., C.C.A

**Assistant Librarians**

Shankar, U  
M.Lib.I.Sc., M.A.  
Mazumdar, K  
Ph.D., M.Lib.I.Sc., B.Com, CPDA  
Nandi, A  
M.Lib.I.Sc., M.Sc.

**Retirement**

Mr. Biswanath Sinha, Library Information Officer, retired on September’2012  
Mr. A.R. Chowdhury, Technical Superintendent, retired on October 2012

**Print and Electronic collection added during 2012-13**

<table>
<thead>
<tr>
<th>Books</th>
<th>Journals/ e-Resources</th>
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<tbody>
<tr>
<td>General</td>
<td>Text Books</td>
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<td>1154</td>
<td>1149</td>
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Besides, 696 bound volumes of periodicals, a good number of theses, reprints and annual reports of other Universities have been added to the Central Library collection during 2012-13.

**New Journals/ e-databases added during the year 2013**

1. ECS Digital Library Package (8 new titles)
2. RSC Core Chemistry Collection (5 new titles)
3. Sage Premier Package (613 new titles)
4. Wiley Customs Collection (233 new titles)
5. Elsevier Journals (2 new titles)
7. Cambridge Law Journals/ CUP
8. Diabetes/ American Diabetes Association
10. Journal of Electronic Imaging/ SPIE
11. More Material and Engineering Science Collection Online (19 new titles)
12. Science and Culture/ Indian Science News Association
INDEST-AICTE Consortium

As a core member of INDEST-AICTE Consortium, Central Library has been getting access to all the fulltext databases, journals subscribed by the consortium. This year Taylor & Francis journals and JSTOR database have been included in the subscription list of the consortium to prove access to all the member institutions.

New Library Services Introduced

- Online Document Delivery Services
- Weekly current arrival list of PhD theses submitted by the students of the Institute

Circulation Section

Circulation section is the gateway between users and documents so it plays a major role to any Library and Information System. Circulation Section performs issue, renewal, return of books using the library management software LibSys. Apart from this basic task many other jobs like membership registration, issue no-dues certificate, inter library lone, overdue fine collection, book reservation, various e-mail alert generation, etc. and all kind of queries by the users are being performed by this section. Central Library Circulation Section is kept open for 63 hours a week.

Institutional Digital Repository:

Institutional Digital Repository (IDR): Central Library has developed an Institutional Digital Repository using open source software namely DSpace. The IDR collects, preserves and disseminates in digital format the research output (PhD theses, Technical reports, Faculty publications, etc.) of IIT Kharagpur research community. It enables the Institute community to deposit (self archiving) their preprints, post prints and other scholarly publications using a web interface, and organize these publications for easy retrieval. At present, the access of 'Institutional Repository' is restricted within the IIT Kharagpur campus LAN only and submission of documents to this repository is also limited to the IIT Kharagpur research community only.

Renovation Works

The Lift in the Library Main Building has been renovated

Facilities created for Library Users in Annexe Building

- Group Discussion Room
- Group Study Room
- Research Scholar Study Room
- 100 Electric power points created for laptop connection

New software/ hardware/ equipment/ furniture

- Libsys version 7
- 12 new CCTV
- 12 desktop Computers
• 1 Server for Libsys
• 71 Reading tables made by CWIS department of IIT Kharagpur
• 300 Reading chairs

Award

Mr. N.C. Das, Staff of the Central Library has been awarded Prof. S. Parthan Library Service Award

Added qualification/attended short term courses

• Mr. Atin Nandi, Assistant Librarian, attended UGC Sponsored Refresher Training Course held at the Department of Library & Information Science, Jadavpur University, Kolkata from 22 August to 11 September, 2012.
• Mr. Arup Kumar Goswami, SLIA, has obtained first class in M. Sc. (Environmental Science) from Vidyasagar University.
• Mr. Arup Kumar Goswami and Mr. Samrat Guha Roy, SLIA, have successfully completed the NET qualification held in June 2012, conducted by the UGC.
• Mr. K. Venu Gopala Rao, Senior Technician, acquired Master of Library & Information Science degree from Annamalai University

New Appointments

Five Professional Trainees have joined the Central Library for one year training programme.

Invited Lectures

• Sutradhar, B. delivered an invited lecture on Future role of Academic Librarians at ICSSR National Seminar on ‘Electronic Librarianship in India: Issues and Trends’ held on 19th May 2012, organized by OUAT, Bhubaneswar
• Sutradhar, B. delivered an invited lecture on Library Activities and services at Tagorean Concept on Library Activities and services held on 17th December, 2012. Organized by K.D. College of Commerce and General Science, Midnapore
• Sutradahr, B. acted as chairperson in technical session of the National Seminar on the theme “A CENTURY OF LIS EDUCATION IN INDIA : PAST, PRESENT AND FUTURE” to commemorate the centenary of LIS education in India during 02-04 February, 2012
• Sutradhar, B. delivered an invited talk on Self Archiving of Faculty Publication in to Institutional Repository at National Conference on Reprographic Rights and Copyright Act: Challenges and Management (NCRRCA-2013) during March 7-8, 2013.
• Samrat Guha Roy and K. Venu Gopala Rao presented a paper ‘Emerging technologies creates infinite opportunities’ at UGC Sponsored National Seminar on Professionalism in Librarianship: issues and challenges in 21st Century at Department of Library & Information Science, Vidyasagar University during 7th to 8th March, 2013
Central Research Facility

Chairmen
Prof. Rahul Mitra, MME Materials Sc. Division
Prof. Ananta Kumar Ghosh, BT, Life Sc. Division

Associated Faculty

Prof. A. Basak, - In charge, CD Polarimeter
Prof. M. Bhattacharjee - In charge, EPR
Prof. S. K. Srivastava - In charge, ESCA
Prof. S. K. Ghosh - In charge, FACS
Prof. S. K. Pabi - In charge, XRD, HRXRD
Prof. J. Dutta Majumder - In charge, FE-SEM
Prof. B. Adhikari - In charge, FTIR
Prof. T.K. Nath - In charge, Hall Effect
Prof. R. Banerjee - In charge, HPLC
Prof. Rahul Mitra - In charge, HRTEM
Prof. K.K. Ray - In charge, UTM (Instron)
Prof. A.K. Das - In charge, MALDI, XRD (Protein Crystallography)
Prof. S. Das Gupta - In charge, ITC
Prof. T. Pathak - In charge, Mass Spectrometer
Prof. S.B. Singh - In charge, OES
Prof. J. Dutta Majumder
Prof. K. Biswas - In charge, Optical Microscopy
Prof. P. Roy Chowdhury - In charge, Optical Fiber
Prof. A.K. Ghosh - In charge, PCR, 2-D Gel, DNA Sequencer
Prof. R. Mitra - In charge, SEM
Prof. C. Jacob - In charge, SPM
Prof. S. Das - In charge, TEM
Prof. K. Das - In charge, Thermal Analysis
Prof. S.H. Dey - In charge, LC-MS/MS
Prof. V. Adyam - In charge, SQUID
Prof. A. Roy - In charge, Raman Spectrometer
Prof. T. Laha - In charge, Nanoindentation & Nanotribology

Senior Scientific Officers

Dr. Amal Kumar Datta Ph. D. (IIT Kharagpur), Experimental & theoretical condensed matter physics.

Dr. Rabindranath Maiti M.Sc., Ph. D. (IIT Kanpur), Inorganic Chemistry, Scanning Electron Microscopy and Metal Matrix Composites

Brief descriptions of on-going activities

Life Science Division

(I) 2D GEL Laboratory: Two-dimensional gel electrophoresis system: this equipment is used for analyzing protein samples (qualitative and quantitative) provided by investigators (students, scholars and faculty of the department of Biotechnology, SMST, and ALPGE).

(II) DNA Sequencer; Real time Polymeric Cyclic Reaction (PCR) analyzer, 2- Dimensional gel electrophoresis Laboratory: This equipment is use to determine nucleotide sequence
of DNA samples provided by different investigators (students, scholars and faculty of the department of Biotechnology, SMST, ALPGE and AgFE).

(III) **Real Time PCR machine Laboratory**: this machine is used to analyze gene expression level (quantitative) in different tissue samples provided by investigators (students, scholars and faculty of the department of Biotechnology, SMST, ALPGE).

(IV) **FACS Laboratory**: the BD FACSCalibur™ system is four-color, dual-laser, bench top system capable of both cell analysis and sorting. This machine is designed specifically to support a wide range of applications like immunophenotyping, absolute counting, residual white blood cell enumeration, stem cell analysis and isolation by sorting. Recent Experiments carried out with this instrument include drug delivery, detection of apoptotic cell death by TUNEL Assay, interaction between cell and fluorescent labeled toxin molecules, and cell cycle analysis.

(V) **High Pressure Liquid Chromatography Laboratory**: HPLC is an efficient technique used for the separation of macro/micro molecules such as organic compound, amino acids, nucleotides, aroma/fragrance, enzymes and proteins etc. this equipment has quaternary pumps, along with different detectors like Refractive Index (RI) and Photo diode array at variable wavelengths, manual injecting valves, ports as well as various columns for separating different molecules.

(VI) **MALDI-ToF Laboratory**: Matrix Assisted laser Desorption Ionization (MALDI)- Time of flight (ToF) mass spectrometry is used for mass analysis of polymers, proteins and other small molecules (>500Da). As well as for biomarker identification of different species.

(VII) **Protein Crystallography: Protein X-ray Crystallography (PX) Laboratory**: Rigaku Micromax 007HF X-ray generator is equipped with RaxisIV++ detector and X-stream cryo for X-ray diffraction studies of protein crystals to determine their 3D structure in atomic resolution. Three dimensional structures of proteins from pathogenic organisms like *M. tuberculosis* and *S. aureus* have been determined.

(VIII) **Isothermal Titration Calorimetry (iTC200 Systems)**: iTC200 is used for characterization of molecular interactions of small molecules, proteins, antibodies, nucleic acids, lipids and other biomolecules. Enzyme kinetics, assessment of the effect of molecular structure changes on binding mechanisms, assessment of biological activity are also possible. Direct measure of sub-millimolar to nanomolar binding constants (10² to 10⁹ M⁻¹) and measurement of nanomolar to picomolar binding constants (10⁹ to 10¹² M⁻¹) using the competitive binding technique.

**Materials Science Division**

(IX) **Field Emission Scanning Electron Microscope Laboratory**: the field emission gun assisted scanning electron microscopy (FE-SEM, Supra 40V, Carl Zeiss, Germany) provides an excellent scope of microstructural characterization using secondary or back scattered imaging, energy dispersive spectroscopy and electron back scattered diffraction analysis. The samples analysed include various metals and alloys, semi-conducting and insulating films, refractories, polymeric and ceramic powders, failed engineering components and hybrid/composite materials.

(X) **FTIR Laboratory**: FTIR analysis of different samples in powder, liquid and also film form in MID-IR and FAR-IR range are done at both ambient and above ambient temperatures by our institute students and faculties.

(XI) **Hall Effect Laboratory**: Electrical resistivity (conductivity), Magnetoresistance and Hall voltage measurements of metals, semiconductors, oxides, heterostructures, etc. Are carried out in the temperature range of 10 – 300 K by employing a closed cycle Helium refrigeration cryostat in the magnetic field range of -10 kOe -0 -+10 kOe. The magnetoresistance and Hall measurements employing a Vander Pauw four probe technique are also used for characterization of materials like magnetic oxides, spintronic materials, nanometric materials, spin sensor material, magnetic multilayers, semiconducting materials, etc.
(XII) **High Resolution Transmission Electron Microscope Laboratory**: The HRTEM laboratory is equipped with the JEOL JEM-2100 High Resolution Transmission Electron Microscope, OXORD INCA EDS microanalytical system and GATAN CCD camera. This instrument is used for observation of specimens to observe the microstructures at high resolution, up to the level of arrangement of atoms, and determination of the crystal structure detects and grain sizes as well as chemical composition at selected positions. In metals, ceramics, polymers rubbers and semiconductor. The machine is routinely used for research on nano-structured materials, bulk alloys, thin films powders, and composites. In addition, it is possible to study phase transitions at low temperatures using the specimen holder operating at the liquid nitrogen temperature.

(XIII) **Optical Emission Spectrometer Laboratory**: Optical emission spectrometer (Model No. ARL 3460) is used for very fast, reliable and accurate analysis of chemical composition. In this machine, the energy coming out from a spark formed between sample and an electrode is converted into a spectral pattern, which is used to analyze the presence of element and it’s quantitative analysis (form the intensity of spectrum).

(XIV) **Optical Fiber Laboratory**: The research in this laboratory is based on design, fabrication and analysis of microstructured optical fiber. The optical fiber perform fabrication unit mainly consists of optical lathe machine, real time monitoring system for temperature and gas flow controller, movement/speed controller of the mechanical stack-holding assembly, and the flame-brush unit. The accessory units like nitrogen plant, chiller plant are integral part of the system.

(XV) **Scanning Electron Microscope (SEM) Laboratory**: The SEM laboratories are equipped with 1) JEOL JSM-5800, 2) ZEISS EVO-60 Scanning Microscopes. The analytical attachments with these instruments are OXFORD ISIS-300, INCA Energy-250 EDS systems, INCA Wave-500 WDS system and HKL Channel-5 EBSD system. The projects associated with the instrument are aluminium alloys, In-situ composites, failure analysis of materials, Biomaterials, Nanostructured materials, Microalloyed steel, Laser surface alloying, Cutting tool materials, Functionally graded materials, Intermetallics, Rubber and Polymer based composites, Ceramic materials etc.

(XVI) **Scanning Probe Microscope Laboratory**: A wide variety of samples have been examined using the Scanning Probe Microscope in the last year. These include metals, polymers semiconductors, nanomaterials, etc.

(XVII) **TEM Sample Preparation Laboratory**: This laboratory provides services for preparing samples of different types of TEM study using instruments like cryo-ultramicrotome jet polisher, and precision ion polishing system (PIPS) etc.

(XVIII) **Thermal Analysis Laboratory**: The thermal analysis laboratory I equipped with Differential Scanning Calorimeter (DSC), Thermo-gravimetric and Differential Thermal Analyzer (TE-DTA) and Thermo Mechanical Analyzer (TMA). The DSC is being extensively used to study the thermal stability of nanocomposites, glass transition temperatures of polymeric materials, and curing of polymeric materials. The recent works of significance done with the TG-DTA system include the evaluation of thermal stability of polymer nano composites, TG studies have been carried out on the calcinations of aqueous combustion synthesized metal oxide powders, analysis of reactions towards formation of new ceramic compounds, effect of mechanical milling on the reaction onset temperature of aluminium based nano composites, etc. The TMA is being used to study the sintering behavior of nano composite materials as well as to determine the thermal expansion coefficients of some newly developed materials.

(XIX) **X-ray Diffraction Laboratory**: X-ray diffraction (XRD) facility includes three units: PW Philips 1710, Expert PRO I and Expert PRO II. While the first unit is used for routine powder diffraction studies, Expert PRO I is dedicated to texture and residual stress analysis and high temperature XRD. Expert PRO II unit is utilized for powder diffraction at normal and high resolution and low angle incidence mode. These units are extensively used to conduct phase
analysis and identification, crystallite size determination, plastic strain measurements, texture evolution, surface residual stress measurements, phase transition studies (ex situ and in situ), volume fraction determination and failure analysis of engineering components.

Circular Dichroism (CD) Spectrometer Laboratory: Circular Dichroism (CD) J-810-150-S Model, 150W air-cooled Xenon Lamp, Head-on photomultiplier tube, 163-900 nm measurement range. Circular Dichroism (CD) is observed when optically active matter absorbs left and right hand circular polarized light slightly differently. It is measured with a CD spectropolarimeter. The instrument needs to be able to measure accurately in the far UV at wavelengths down to 190-170 nm. The difference in left and right handed absorbance $A(l) - A(r)$ is very small (usually in the range of 0.0001) corresponding to an ellipticity of a few 1/100th of a degree. The CD is a function of wavelength. It has become a powerful tool to analyze the structure of biomolecules and their interaction with various ligands. Changes in the CD spectra reflect a perturbation in the structure of biomolecules brought about by changes in conditions like temperature, pH or drug binding. Protein folding/unfolding can be followed by changes in the CD spectra. Stereochemistry of products through enzymatic reactions is also an important activity of CD spectroscopy, which is related to the 3D-structure of the active site of an enzyme. Stereochemistry of products through enzymatic reactions is also an important activity of CD spectroscopy, which is related to the 3D-structure of the active site of an enzyme.

Mass Spectrometer Laboratory: Mass Spectrometer LCT is a compact, fully integrated, computer controlled, high performance, orthogonal acceleration Time-of-Flight (oa-TOF) Mass Spectrometer that can be configured for a wide range of LC-MS applications. It provides both exact molecular weight (HRMS) and structural information (LRMS) for characterization of mainly organic compounds and some organometallic compounds and metal complexes with excellent sensitivity. Both synthesis and elemental confirmation can be obtained that is essential for the support of patent applications or for the submission of data to scientific journals. The types of projects on which the equipment can be associated with are based on Synthesis Confirmation, Elemental Confirmation, Structure of Natural Products, Drug Discovery, Supramolecular Interactions/Drug-Receptor Interactions, and Environmental Monitoring. The equipment has been rendering extremely valuable service since its inception to the users within IIT, Kharagpur and external users from various academic institutes, R & D laboratories and industries.

SQUID VSM Laboratory: The Quantum Design MPMS SQUID VSM EverCool system features an integrated pulse-tube cryocooler-dewar system. This eliminates the need to use any liquid cryogens for the operation of the MPMS SQUID VSM. It offers $1 \times 10^{-8}$ emu sensitivity with fast data acquisition. A maximum DC magnetic field up to 7T in temperature range 2-1000K is available in both DC and AC magnetization measurements. Information about hysteresis loops, relaxation times, magnetic field and temperature dependence of magnetic moment can be obtained. Magnetic properties of broad range of samples related to materials, geological and biological can be analyzed. System Model No: - SVSM-EC, Serial No. SMT 043

Transmission Electron Microscope Laboratory: Transmission Electron Microscope with ability to study structure and composition is being procured. The chosen electron microscope is operated at acceleration voltages up to 200 kV. The machine is equipped with high tilt specimen stage, which is essential for examination of structural defects in materials. It will be possible to study specimens using bright and dark field imaging, selected area diffraction, convergent beam electron diffraction and energy dispersive spectroscopy. The Energy Dispersive X-Ray Analyzer provided with the transmission electron microscope will be able to detect element composition, both qualitatively and quantitatively. The CCD Camera records images on high resolution transmission electron microscope electronically. The accompanying softwares are going to be used in analyses of images. Model FEI-TECNAI G2 20S- TWIN.
(XXIV) **Raman Spectrometer Laboratory:** Raman spectroscopy is an efficient non-destructive tool, which provides enormous information on various physical properties of new state of art materials. The Triple Raman Spectrometer, T64000 from Jobin Yvon, Horiba, France, is equipped with Ar-Kr ion laser (with 10 laser lines) as an excitation source, a triple monochromator and a CCD detector (1024×256 pixels). It has a capability to reject Rayleigh line to a very high extent for all 10 laser lines. Hence, using this instrument one can record spectra from as low as 2 cm⁻¹ Raman shift. Other than material characterization, it can be used for resonance Raman measurements and acoustic phonon measurements. No tool-specific sample preparation is required for the measurements. The incident radiation can directly interact with the sample. The system works for all types of sample, solid (powder or crystalline), liquid and gas.

(XXV) **Nanoindentation & Nanotribology Laboratory:** The nanoindenter with nano-tribological testing facility (TI 950 TribolIndenter, Hysitron Inc., USA) in the “Nanoindentation & Nanotribology Laboratory” at Central Research Facility in IIT Kharagpur is a Nanomechanical characterization instrument with in-situ SPM (Scanning Probe Microscopy) imaging, facility, through which mechanical properties like hardness, Young’s modulus, stress-strain behavior, creep indentation fatigue resistance and fracture toughness of thin films, coating, individual phases in a multiphase alloy, composites and soft biological tissues can be studied. The instrument is capable of carrying out various mechanical testing operations in nano-scale as well as in micro-scale, owing to its dual head testing capability. The various mechanical testing could be carried out at higher temperature (up to 400°C) also. Integrated with low-noise three-plate capacitive transducers and electronics, the multi-layered enclosure and active vibration isolation system provide excellent environmental separation for the instrument.

(XXVI) **High Resolution Mass Spectrometry Laboratory:** Mass Spectrometer Model Xevo G2 QT of waters UK Ltd. The Xevo G2 QTof Mass Spectrometer is a highly sensitive, exact mass bench top system. The instrument is equipped with a T-wave collision cell and with a orthogonal acceleration Time-of-Flight (oa-ToF) mass analyzer with a wide mass range up to 100,000 m/z and a resolving power of 20,000 FWHM. It provides both exact molecular weight (HRMS) and structural information (LRMS) for characterization of mainly organic compounds and some organometallic compounds and metal complexes with excellent sensitivity. The range of compounds for which the instrument can be used varies widely from small organic, inorganic, compounds to oligomers, polymers and biomolecules. The instrument will provide elemental confirmation that is essential for the support of patent applications or for the submission of data to scientific journals. The system incorporates IntelliStart™ technology, for automated system optimization and status monitoring, ensuring that the highest quality data is routinely available to all levels of operation.

(XXVII) **Isothermal Titration Calorimeter:** Model, ITC200 Systems (GE Healthcare, USA), Non-reactive Hastelloy® cells for chemical resistance, Peltier controller for rapid temperature equilibration, operating within a temperature range of 2°C to 80°C.

**New Acquisitions**

1. DUAL/ CROSS BEAM FEG/FIB, MICROSCOPE CARL ZEISS GmbH, GERMANY.
2. AVANCE III HD 600 MHz ONEBAY HIGH PERFORMANCE DIGITAL NMR SPECTROMETER, BRUKER BioSpin INTERNATIONAL, SWITZERLAND.
3. SCANNING PROBE MICROSCOPE SYSTEM WITH DIFFERENT MODULES FOR MORPHOLOGICAL AND STRUCTURAL CHARACTERIZATION, AGILRNY TECHNOLOGIES, SINGAPORE.
4. PHI 710 SCANNING AUGER NANOPROBE, PHYSICAL ELECTRONICS, USA
5. FLUORESCENCE ACTIVATE CELL SORTER, Model- FACS ARIA-III, BECTON DICKINSON HOLDING, SINGAPORE.
6. GENETIC ANALYZER (APPLIED BIO SYSTEM-3500), LIFE TECHNOLOGIES HOLDINGS Pte. Ltd, SINGAPORE.
7. 380 KVA SILENT DIESEL GENERATOR SET WITH AMF PANEL, KIRLOSKAR Make.

Seminars, Conferences and Workshops Organised

- Dr. Ritwik Basu (Oxford Instruments), Electron backscattered diffraction, March 5-6, 2013
- Dr. Partha Pratim Das (Nano Megas), Precession Electron Diffraction and 3D Diffraction Tomography, February 7, 2013
- Dr. Yashveer Singh (Anton Paar Ltd.), Small Angle X-Ray Scattering, February 5, 2013
- Dr. John Hammond (Physical Electronics, USA), Scanning Auger Nanoprobe, December 8, 2012
Central Workshop and Instruments Service Section

**Chairman**  
Prof. A. Roy Choudhury

**AWS**  
Dr. S. Patra

The Central Workshop & Instruments Service Section (CWISS), a unique service centre at IIT, Kharagpur was established in 1965 to cater to the fabrication of custom made Instruments to sustain the Post Graduate & Research activity in the Institute for all the departments and centres.

It is one of the major service sections of the Institute having following units:

1. Mechanical  
2. Glass Blowing  
3. Carpentry  
4. Electronics  
5. Audio Visual

Apart from executing Work Orders from various Depts./Centres/Sections of the Institute, CWISS also undertakes Work Orders from outside on cost basis.

**Mechanical Section**

Mechanical Section in CWISS comprises Mechanical fabrication, Mechanical Instrument and Glass Blowing Section.

1.1. Mechanical Fabrication Section

It is equipped with various types of machines like CNC Lathe, table mounted CNC Lathe, CNC Engraving, CNC Milling, EDM, Milling, Conventional Lathe, Bench Lathe, Watch Maker’s Lathe, Drilling, Shaping Machine, Bench Drill, Bench Shaper, Grinding Machines (Surface, Cylindrical, Pedestal, Belt and Hand operated), Jig Boring, Power Saw, Shearing Machine, Polishing, Press, Arc Welding, Brazing and Soldering, etc. We have recently purchased one CNC WEDM and Laser welding machine these has enhanced our fabrication quantity and quality as well.

The Mechanical Fabrication Section caters the service to almost all the departments of the Institute for any type of Precision and complicated mechanical fabrication or repair with various types of metals with the machines available in section mostly for research and project works and regular experiment classes for B. Tech. and M. Tech. as per design.

In CNC Machines we use different types of software for drawings like Auto CAD, Rhinoceros, 3D Studio Max, Solidworks etc. for drawing works of the components to be fabricated and also use different types of CAM software for their fabrication.

During the year 2012-13 the Mechanical Section has performed jobs of about 140 work orders.

Some of the notable fabrications successfully completed by CWISS are as follows.

1) Fabrication of different types of nozzle.
2) Chassis of Robot for Robocup project.
3) Fabrication of Vibration absorber.
4) Fabrication of different types of Wave Guides.
5) Fabrication of Die and Extruder.
6) Fabrication of Die-Punches of different sizes.
7) Fabrication of different sizes tensile, Charpy specimens of different materials.
8) Fabrication of Rack, Pinion & Gears.
9) Fabrication of Moulds with different type of metals.
10) Fabrication of Venturimeter.
11) Fabrication of different types of grippers.
12) Fabrication of Micro-channel of various sizes.
13) Fabrication of different types of adopters.
14) Fabrication of various types of electrodes.
15) Fabrication of fixtures for experiments.
16) Fabrication of shaft encoder.

2.0 Glass Blowing Section

This section is equipped with glass blowing lathe, glasscutter, glass grinder, glass annealing chamber, etc. Mainly glass work of Borosilicate glass is done here with the help of oxygen & LPG for Departments, like Chemistry, Bio-Technology, Chemical, Cryogenic, Mechanical, Material Science, Metallurgical Engg., Agriculture & Food Engg., Aquaculture, Physics & Meteorology etc. The main fabrication jobs of this section include different type of condensers, Dewars, different volume capacity F.B., R.B., Flusk with neck joints, manometer, U & S Tubes, glass bubbler, glass coil for oil bath, gas collector, etc. The fabrication of Glass ware items are done as per drawing and design of the equipments.

3.0 Carpentry Section

Housed in the workshop complex behind Chemical Engg. & Automobile Section, This section has Auto Planner, Joints Nature’s machinery, Vertical Band Saw and Multipurpose Machine. Apart from carpentry jobs, as per requirement of the Institute it does also undertake construction of MS Frames, Hand painting, Spray painting, Polishing, Writing of name Plates, display board & jobs as required by students projects. This year this section has manufactured 26 Nos. special reading computer tables for our Central Library. 20 Nos. of special purpose table for research scholars in Mechanical Engineering Department and other useful furniture for various departments.

This section also meets the major requirements of furniture of the Institute. During the year 2012-13, this section has completed 51 Work Orders of various departments of the institute.

Details of some of the Work done during period:

1) Faculty Table -- 04 Nos.
2) Office Table -- 02 Nos.
3) Computer Table (Special/Ordinary) -- 24 Nos.
4) Laboratory Table -- 45 Nos.
5) Counter Table Set -- 02 Nos.
6) Book Shelf -- 18 Nos.
7) Students’ model of different shape -- 31 Nos.
8) Wooden Pointer -- 01 No.
9) Gate Pass Box -- 10 Nos.
10) Repair of Table/Rack/First Aid Box -- 07 Nos.
11) Name Plate/ Sign Board -- 20 Nos.
12) Cup Board -- 01 No.
13) Wall Cabinet -- 01 No.
14) Wooden Platform -- 01 No.
15) Foot Rest -- 07 Nos.
16) Key -- 01 Nos.
17) Big (3ft. long) wooden spoon -- 01 No.
18) A.C. Window sealing Ply -- 05 Nos.
19) Inclusion of name on different incumbency board -- 02 Nos.
4. **Electronics Section**

Electronics section of CWISS has facilities for repair of different types of electronic equipments. It also helps users in their design and development activities. A LPKF PCB Prototyping machine is available in this section which helps the users of different departments in fabrication of double sided PCBs.

5.0 **Audio Visual Section**

Audio Visual Cell is primarily involved in providing audio visual support for conducting regular classes at different lecture halls (approximately 150 classes per week). It supports audiovisual facilities with Multimedia projectors, Document cameras, PCs and PA system with wireless microphones for the following class rooms: V1, V2, V3 & V4 at Vikramshila complex and F116, F127, F142, F232 & F244 at main building area. AV Cell used to provide support about 5000 regular classes throughout the year in aforesaid classrooms. Besides these the Cell provides AV facilities for all seminars, symposiums, workshops, short term courses and meetings at Gargi, Moitrei, S. N. Bose Auditorium and associated programme at Netaji, Kalidas Auditorium, Senate hall, Committee room and Board room. All the T. S. G. activity programmes are also supported by the Cell. AV Cell also provides support to various student activities like Quiz, Plays, Spring festival, Kshitij, Inter Hall competitions and T&P activities. It also helps in various other academic activities like Convocation, Senate Meeting, National & International seminars, Conferences and Workshops and also including JEE & GATE units. AVCell also given technical support for pre-placement talk during office hours & beyond office hours and sometime till midnight for special cases.

The Audio Visual Cell has a number of sophisticated equipments like Multimedia Projectors, Document Cameras, High quality Amplifiers and Mixtures, Wireless Microphones & Conference Systems and other peripheral supporting systems. Primary maintenance of these equipments are also maintained by AVCell staff itself.

From next academic section 44 Nos. new class rooms will be started at Nalanda class room complex. For the smooth running of these classes all the AV facilities would be supported by AVCell of CWISS.
Centre for Theoretical Studies

Head
Pratim Kumar Chattaraj

Concerned Faculty / Officers

P. K. Chattaraj  
M. Sc., Ph.D (IIT Bombay), Chemistry (Theoretical Chemistry, Quantum Chaos )  
Ph.D (IIT Kharagpur),

A.R.Roy  
General Theory of Relativity, Theoretical Cosmology, Algebra and Application of Soft Set theory, Dynamics of Nonlinear Systems

A. Taraphder  
M. Sc., Ph.D (IISc Bangalore), Physics (Theoretical Condensed Matter Physics)

S.Bharadwaj  
M. Sc., Ph.D (IISc Bangalore), Physics (Theoretical Astrophysics and Cosmology)

Sayan Kar  
M. Sc., Ph.D (IIT Kanpur), Physics (Relativity and High Energy Physics )

S. Pratik Khastgir  
M. Sc., Ph.D (IOP, Bhubaneswar), Physics (Mathematical Physics and Integral Models)

Anirvan DasGupta  
B.Tech, M.Tech., Ph.D (Kanpur), Mechanical (Dynamics, Control and Robotics. )

S.P.Pal  
B. Tech (Hons.), M. Tech, Ph.D (IISc Bangalore), Computer Sc. and Engg.  
(Computational geometry, Design and analysis of algorithms.)

S. Bandyopadhyay  
M. Sc., Ph.D (IISc Bangalore), Chemistry (Computational Chemistry, Molecular Modelling )

Somesh Kumar  
MSc.,Ph.D (IIT Kanpur), Statistical Decision Theory and Inference, Quantum Computing

Suman Chakraborty  
Ph.D, Microfluidics and Nanofluidics, Interfacial Phenomena, Transport Phenomena in Materials Processing, Computational Fluid Dynamics (CFD)

G.P.Raja Sekhar  
Ph.D.(Hyderabad Univ), Boundary integral methods for viscous flows, Mass transfer in porous biologocal pellets

Pratima Panigrahi  
Ph.D.(Bangalore), Combinatorics, Graph Theory

Staff

<table>
<thead>
<tr>
<th>Name</th>
<th>Degree</th>
<th>Specialization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ujal Halder</td>
<td>Post Diploma in Computer App., Diploma in Electrical Engg.</td>
<td>Computer (Administration, Networking, Web development, Troubleshooting etc.)</td>
</tr>
</tbody>
</table>

Project Staff:

<table>
<thead>
<tr>
<th>Name</th>
<th>Project, Post</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subhasis Panda</td>
<td>CSIR JRF</td>
<td>3 years</td>
</tr>
<tr>
<td>Rajibul Shaikh</td>
<td>CSIR JRF</td>
<td>1 year</td>
</tr>
</tbody>
</table>
RESEARCH AND DEVELOPMENT

A) Brief Descriptions on-going activities :-

Research is carried out in CTS on the following areas :

I. Astrophysics, Cosmology and Relativity
   (i) Magnetic fields of strange stars and neutron stars
   (ii) Large scale structure formation in the Universe
   (iii) Bulk--brane dynamics

II. Dynamics and control
   (i) Nonlinear dynamics: Bifurcation Theory and Chaos
   (ii) Control theory
   (iii) Vibrations

III. Mathematics, Mathematical physics and Theoretical Computer Science
   (i) Integrable models
   (ii) Computational and combinatorial geometry
   (iii) Pure and applied mathematics
   (iv) Quantum computation and quantum information
   (v) Graph and Hypergraph Theory

IV. Theoretical Condensed Matter Physics
   (i) Computational Condensed Matter and Statistical Physics
   (ii) Superconductivity

V. Theoretical Chemistry
   (i) Large scale simulations of complex systems
   (ii) Density functional theory, quantum chaos

B) Thrust Areas:--

- Astrophysics, Cosmology & Relativity
- Nonlinear Sciences
- Mathematics, Mathematical physics and Theoretical Computer Science
- Theoretical Condensed matter Physics
- Theoretical Chemistry

ACTIVITIES

Courses and Graduate Programme:

CTS is offering new advanced post-graduate courses which are relevant across departments through involvement of faculty from various departments. These courses are:

1. Methods in molecular simulations (TS70001)
2. Advanced dynamics (TS70002)
3. Wave propagation in continuous media (TS70003)
4. Advanced Mathematical techniques (TS70004)
5. Advanced quantum theory (TS70005)
6. Quantum mechanics and quantum computing (TS70006)

CTS are also admitting PhD students through institute fellowships, CSIR fellowships. Currently two such students are enrolled.

**CTS courses taught (2012-13):**

- Advanced dynamics (TS70002) (Autumn)
- Advanced Mathematical techniques (TS70004) (Autumn)
- Methods in molecular simulations (TS70001) (Spring)
- Wave Propagation in continuous media (TS70003) (Spring)

**SPONSORED RESEARCH**

<table>
<thead>
<tr>
<th>Sl No</th>
<th>List of Project</th>
<th>Sponsoring Agency</th>
<th>Duration From</th>
<th>To</th>
</tr>
</thead>
</table>

**FACILITIES**

- A Computer Lab with 11 Pentiums, 2 Quad core server and 2 AMD Opteron Server, HP color Laserjet duplex network printer, HP Laserjet duplex network printer, Scanner, Multimedia Projector, Canon copier
- Software (Mathematica, Matlab, Maple, Scilab, IDL, Aips, Comsol etc.)
- CTS library

**Aims & Objectives:**

- To generate and nucleate theoretical research
- To organize seminars on diverse topics
- To organize Conferences/Workshops
- To provide research facilities to students/faculties from within and outside IIT Kharagpur
- To offer postgraduate level elective courses

The Centre for Theoretical Studies (CTS) at the Indian Institute of Technology, Kharagpur (IIT Kgp) has been in existence since 1998 and is located in the first floor of the Sahid Bhavan (Old Institute Building) at the Eastern end of the IIT campus. Its primary goal is to generate and nucleate theoretical research on fundamental aspects of basic and engineering sciences. The role of the CTS in the academic framework of IIT Kgp is to bring together people of similar interests under a common umbrella. The CTS, apart from acting as a facility for research in theoretical studies in science and engineering, also trains graduate students and provide opportunities to post-doctoral workers and researchers from outside IIT Kgp. Additionally, the CTS has an active visitors programme of both short and long term visitors. The CTS also organizes seminars, workshops on a regular basis on diverse topics. An important component of CTS workshops and seminars is to motivate young
students (both undergraduates from IIT Kgp and graduate students from within and outside IIT Kgp) to actively pursue theoretical research in front-line areas of science and engineering. Finally, besides promoting research on specialised topics within a given sub field, the CTS hopes to cultivate interdisciplinary theoretical research as a major goal, tapping the diversity available in the academic population of an Institute like IIT Kharagpur.

Visitors Programme:

Objective:

To provide facilities to faculty members, postdoctoral fellows and students from academic and research institutions in India and abroad to conduct research on theoretical problems in science and engineering in collaboration with faculty members of IIT Kharagpur.

COLLABORATIVE EFFORTS

The Center for Theoretical Studies has very active collaborative research programmes in the board areas of Astrophysics and Cosmology. The research carried out under this collaboration is focused mainly on Cosmology. The collaboration with NCRA, TIFR, Pune is through a sponsored project funded by BRNS, DAE, Mumbai. This focuses on the possibility of using low-frequency radio wave observations to study a variety of astrophysical processes through the 21 cm neutral hydrogen radiation, including turbulence in the interstellar medium and the early universe.

Visitors during 2012 – 2013 under CTS Visitors Programme

<table>
<thead>
<tr>
<th>SL. NO.</th>
<th>NAME OF THE VISITOR</th>
<th>INSTITUTE/UNIVERSITY</th>
<th>ASSOCIATED FACULTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dr. Sujit Kumar Bose</td>
<td>Prof.[Retd.], S.N.B.N.C.B.S, Kolkata</td>
<td>Prof. S.Dey Civil Engg. Dept.</td>
</tr>
<tr>
<td>2</td>
<td>Mr. Debajyoti Choudhuri</td>
<td>Ph.D., Univ. of Hyderabad</td>
<td>Prof. G.P. Raja Sekhar Dept. of Mathematics</td>
</tr>
<tr>
<td>3</td>
<td>Dr. Sk. Saiyad Ali</td>
<td>Lecturer, Dept. of Physics, Jadavpur University</td>
<td>Prof. S.Bharadwaj Dept. of Physics</td>
</tr>
<tr>
<td>4</td>
<td>Dr. Prasun Dutta</td>
<td>PDF, NCRA-TIFR, Pune</td>
<td>Prof. S.Bharadwaj Dept. of Physics</td>
</tr>
<tr>
<td>5</td>
<td>Dr. Abdul Kadir</td>
<td>Post Doc, Institute of Solid State Physics, Berlin</td>
<td>Prof. S.Majumdar Dept. of Physics</td>
</tr>
<tr>
<td>6</td>
<td>Dr. Sanjit Das</td>
<td>PDF, IMSc, Chennai</td>
<td>Prof. S.Kar Dept. of Physics</td>
</tr>
<tr>
<td>7</td>
<td>Dr. Santanu Sengupta</td>
<td>Asso. Prof., CVRCE, Bhubaneswar</td>
<td>Prof. P.K. Chattaraj Dept. of Chemistry</td>
</tr>
<tr>
<td>8</td>
<td>Dr. Satadal Paul</td>
<td>Lecturer, Dept. of Chemistry, Siliguri</td>
<td>Prof. P.K. Chattaraj Dept. of Chemistry</td>
</tr>
<tr>
<td>9</td>
<td>Dr. Utpal Sarkar</td>
<td>Asst. Prof., Assam University, Silchar</td>
<td>Prof. P.K. Chattaraj Dept. of Chemistry</td>
</tr>
<tr>
<td>10</td>
<td>Mr. Pratap Kumar Swain</td>
<td>Ex Research Scholar, Dept. of Physics, IIT Kharagpur</td>
<td>Prof. K.L. Panigrahi Dept. of Physics</td>
</tr>
</tbody>
</table>
LECTURES BY VISITING EXPERTS

Seminars

1. Title: From Natural Numbers to Numbers and Curves in Nature
   Professor Ashok K. Mallik
   Bengal Engineering and Science University, Shibpur
   Date: September 7, 2012

2. Title: Solar Magnetic Fields, Space Weather and Climate
   Dr. Dibyendu Nandi
   Indian Institute of Science Education and Research, Kolkata
   Date: October 30, 2012

3. Title: Magnetic coupling and anisotropy in Metal-based Systems
   Anirban Misra
   Department of Chemistry, University of North Bengal, Siliguri
   Date: November 09, 2012

4. Title: What is hyperbolic geometry?
   Prof. Mahan Maharaj
   Ramakrishna Mission Vivekananda University, School of Maths., Belur Math, Howrah
   Date: November 15, 2012

5. Title: Dependence of diffusion on diffusant diameter in different condensed phases of matter
   Professor S. Yashonath
   Solid State and Structural Chemistry Unit, IISc, Bangalore
   Date: December 04, 2012

6. Title: Oscillators: Old and New
   Prof. Jayanta K. Bhattacharjee
   Director, Harish-Chandra Research Institute (HRI), Allahabad
   Date: January 15, 2013

7. Title: Design of NLO-materials through sum-over-state approach
   Professor Prasanta K. Nandi
   Department of Chemistry, BESU, Shibpur
   Date: February 11, 2013

8. Title: DFT of atoms and molecules in Cartesian grid
   Professor Amlan K. Roy
   Department of Chemical Sciences, IISER, Kolkata
   Date: February 25, 2013

9. Title: An Unbiasedness Approach to Linear Regression Analysis
   Professor P. Vellaisamy
   Department of Mathematics, IIT Bombay
   Date: February 28, 2013

10. Title: Selecting the Better of Two Gamma Populations Having Unequal Shape Parameters
    Professor Neeraj Misra
    Department of Mathematics and Statistics, IIT Kanpur
    Date: March 01, 2013

S. Datta Majumdar Memorial Lecture

   Title: The Higgs Boson/God Particle: A story of particles and interactions
   Professor Amitava Raychaudhuri
   Sir Tarak Nath Palit Professor of Physics, University of Calcutta
   Date: October 15, 2012
RESEARCH PUBLICATIONS

In Journals (Publications involving Visitors under CTSVP and Ph.d. student of CTS only)


Computer and Informatics Centre

Head
Prof. Prabir Kumar Biswas

Faculty / Officers

Dilip Kumar Nanda  
M.Sc, DIIT, PhD (IIT Kharagpur), IT Infrastructure Management and Operations, Application Software & Numerical Techniques

Partha Goswami  
BTech (C.U), M.Tech (IIT Kharagpur), Enterprise & Optical transport network

Alok Baran Das  
B.Tech (CU), Networking, Hardware Specialist & Trouble shooter

Bimal Kanti Dutta  

Surid Kumar Das  
B.Tech, MTech (Rajasthan Vidyapith Deemed University), Hardware, Computer Network

A. Chattopadhyay  
M.Sc, M.S (IIT Kharagpur), Hardware, OS,Network Security & Applications

Sudipto Das  
B. Tech, MTech (Rajasthan Vidyapith Deemed University) , OS, Network Applications and Security

Deepan Banerjee  
B.Tech (WBUT), Networking, Routing Switching & Wireless

Tanumoy Ghosal  
B.Tech (WBUT), Networking & Security Aspects

Subhasish Chattopadhyay  
B Tech (WBUT), Networking & Specialist in FTTH

RESEARCH PUBLICATION

Partha Goswami, Rajarshi Mahapatra and Sw. Divyasukhananda, " Bridging the Digital Gap in Rural India; VIVEKDISHA: A Novel Experience, " 19th annual National Conference on Communications (NCC-2013), Delhi, February 15-17, 2013.

FACILITIES

Networking Facilities in the Institute

In continuation of the networking services that is being provided to the Institute community by CIC, it has installed 10Gbps redundant fiber optic backbone to interconnect all Department/Centre/Schools. It has also installed 1Gbps access link to each individual user of the Institute in academic and hostel area. The telephone network is spread over copper cables. The Network Infrastructure is now extended to the residential area through Gigabit Passive Optical Network (GPON). This has been implemented under Quadruple Play Network (QPN) project. As a result Institute Network infrastructure is capable to cater to Data, Voice, Video & Wi-Fi to the Institute Community throughout the campus. The upgradation of the network infrastructure has been carried out to cater to the network demands of the Institute for the next ten years. The upgraded network has the following features:

a) All distribution switches are connected to dual core switches through 10 Gbps redundant link.

b) Access link is 10/100/1000 Mbps to support the present network interface card of the computers.

c) A Wi-Fi network has been overlaid in all Hostels and all departments (locations mentioned above) to avoid any further adhoc UTP cabling.

d) All network switches located at various locations have been housed in a structured fashion.

e) Existing Computational facility has been upgraded to high performance by using blade servers.
f) Video conferencing with higher bandwidth allocation is possible with NKN connection

g) All the schools in the campus area has been connected through GPON technology

h) Additional fiber and copper cable will be laid in the next phase wherever required.

i) All the Security surveillance cameras is being planned to be connected through GPON technology

j) Electrical meter reading will be collected over network from different multi Storyed through

Network

Salient Features:

1. Implemented a state of the art “Quadruple Play” services integrating Data, Voice, Video and Wireless.

2. The system has been designed keeping in mind not only the present population and their activities but will take into account the Institutional Development Programme (IDP).

3. The old quarters, which are planned to be demolished, are now covered only by wireless services. However fiber has been taken to each sub zone.

4. The system is designed in such a way that full services may be extended to any new unit (whether residential or academic) coming up by making only local connections.

5. The Wireless Coverage in the campus have the following features:

   a. The wireless service is expanded from the earlier state of a few hot spots in the academic area to the entire campus.

   b. Some of the access points are fed from the CIC through fiber while others are fed through a Wi-Mesh. Wi-Mesh has been designed to extend the reach of Wi-Fi networks over long distances by allowing multiple access points to carry each other’s traffic. Unlike Wi-Fi hotspots, which need a direct wired connection to the network, mesh networks will pass the data request to the adjacent access points until a network connection is found.

   c. Access points are hosted on the Lamp post and its power is being fed from the nearest electrical junction box.

6. The new Voice Services encompass the following:

   a. There is a provision of at least 5000 new lines.

   b. The PBX of TTC, which has a life of two to five years more, and the existing copper plant will be retained and used as it is for as long as possible.

   c. New voice services, based on VOIP technology, are coming mainly from the new system through GPON infrastructure and there is a seamless integration between the two using appropriate gateways.

   d. The integration components have been chosen in such a fashion so that they continue to work even if the existing PBX is replaced in future.

   e. New telephone connections have minimized the requirement of digging in the campus to lay new telephone cables.

   f. New telephone connections are a mix and match solution with possibility of giving services through analog POTS, IP Phones or Wi-Fi enabled handsets.

7. The Data Services involved the following:

   a. Data services at hostels and academic areas have been upgraded.

   b. Data services have also been extended to the new Laboratory complexes.

   c. Wireless data services are available everywhere in the campus.

   d. Ethernet data services are available in the academic areas, hostels, flats and other important buildings like guesthouses.

   e. Each zone in the campus has a minimum 2.5 Gbps link.

8. The Video services have the following features:

   a. Provision of IP Video is available at all Ethernet points.

   b. Provision of RF Video is available all over the campus through a hybrid Fiber-coaxial infrastructure.

   c. There is a facility to take RF Video feed from more than one service provider.

   d. Radio over fiber has been integrated with IP streams over the same fiber using WDM.
9. The **Backbone Fiber Plant** as follows:

   a. The earlier existing fiber plants in the Hostel and Academic area have been used.
   b. The rest of the campus has been divided into 12 zones.
   c. One 48 core fiber has been taken to each zone and terminated in a hut.
   d. Passive splitting using PON technology has been used where FTTx is implemented.
   e. EDFA amplifiers have been used for managing the optical power.
   f. Each zone is divided into 4 to 6 sub-zones. 24 Core Fiber has been taken to each sub-zone from the zonal huts.
   g. Fiber has been taken to the base of the few access points, which are fed from the CIC for the Wireless networks.
   h. Each residence with FTTH has an ONT unit with uninterrupted power supply.
   i. The units (huts), which are placed outside, contains only passive elements so that maintenance requirement is minimum.

**Laboratory Facility**

The Computer laboratories 4 in number are being utilized to the fullest by engaging them to support the Institute academic activities and also for the Training & Placement as well as all students requirements related with Techno fests organized by them.

**Software Facility**

- Institute is successfully utilizing the antivirus software “Trend Micro Enterprise Security Suite with Advanced Reporting Module” for 20000 User licenses. This software would be protecting the Endpoint Security, Gateway security, Web Gateway, Messaging Gateway, Mail Servers, File Servers and also be capable of providing advanced reporting on possible threats.
- Software for Mail Messaging Solution for 20000 users is also providing excellent service for the past three years which is available for faculty, staff and students of the Institute.
- Other software available to the user community include, Microsoft campus wide licensing, Software’s like Abacus (for finite element modeling and analysis), MATLAB (for integrated technical computing), Solid Works (for engineering drawing), PASW (statistical package) and ANSYS etc.
Continuing Education Center

Dean
Prof. Somnath Sengupta

A) Short Term Courses Organized by the Unit

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Short term courses organized under</th>
<th>No. of Courses</th>
<th>No. of participants</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>QIP (AICTE) Short Term Courses</td>
<td>08</td>
<td>240</td>
<td>12 Weeks</td>
</tr>
<tr>
<td>2.</td>
<td>Sponsored/Self finance Short term courses</td>
<td>53</td>
<td>1330 (approx.)</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Workshop/ National &amp; Int. national Conference</td>
<td>13</td>
<td>512</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total =</td>
<td>74</td>
<td>2082</td>
<td></td>
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</table>

B) M. Tech Programme organised by the Unit

<table>
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<th>Sl. No.</th>
<th>Name of the Subject</th>
<th>No. of Students</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Electrical Engineering</td>
<td>45</td>
<td>3 Years</td>
</tr>
<tr>
<td>2.</td>
<td>Electronics and Electrical Communication Engineering</td>
<td>75</td>
<td>3 Years</td>
</tr>
<tr>
<td>3.</td>
<td>Information &amp; communication Technology</td>
<td>56</td>
<td>3 years</td>
</tr>
</tbody>
</table>

Facilities :
Transit Hostel Accommodation for 40 Beds Capacity.
Dormitory accom. In Kolkata Extension Centre for 12 beds capacity.
Operational Studios at Kolkata (3), Bhubaneswar (3) and Kharagpur (3) & Raipur (2) Seating Capacity (60 + 40 + 40 + 40 +40)

Equipments
- Lap Top (Eleven numbers)
- High luminosity overhead projectors.
- LCD Panel for multimedia projection. (12nos.)
- 3M Multimedia Projector. (06 nos.)
- Shure cordless microphone and transmitter/receiver set. (2 nos. for each class room.)
- Ahuja tape recorder and public address system.

C) Seminars/Workshops/Conferences Organized by the Unit

| Total No. of Workshops/Conferences Organized | : 13 |
| Total No. of participants attended | : 512 + |

D) Particulars of M.Tech and Ph.D scholars joined/completed :

A. No. of Teachers completed Ph.D degree : 11
B. No. of Teachers completed M.Tech programme : 30
C. No. of Teachers joined Ph.D programme : 22
D. No. of Teachers taking advance admission to Ph.D programme : 12
E. No. of Teachers joined M.Tech. programme : 09
Estate (E&M) Works Section

Professor-In-Charge
Prof. Debapriya Das

Executive Engineers (Electrical)
Sabyasachi Ghosh

Estate (E&M) undertook various electrical works in the Academic Area, Substations & Distribution, Residential Area and Hostels. Brief description of major activities completed during 2012-13 are as follows:

Academic Area

1. Electrification of Steel Technology Centre & New Mechanical Workshop.
3. Installation of Cable Tray & Trunkbusbar System in the Main Building of the Institute.
5. Electrification of 2nd & 3rd floor of J C Bose Laboratory Complex.
7. Green LED lighting in the corridor of Main Institute Building.

Substations & Distributions

1. Installation of New 3 x 500 kVA, 11/4.15V Substation for Railway Research Centre.
2. Modification of S/Stn Nos. 7 & 13 with installation of 2 additional 11kV Vacuum Circuit Breakers and new battery chargers and battery banks assembly in S/Stn. Nos. 3, 7 & 11. This has been done to ensure automatic operation of switchgears which could enable future implementation of remote operation of Substations.
3. Conversion of all manual operated 11kV VCB into Auto operating circuit breakers.
5. Illumination & augmentation at TATA Sports Complex.
6. Area lighting with LED lights in the parking space of Alumni Guest House and New Central School.

Residential Area

1. A new auto operative 125 kVA DG Set at B.C.Roy Tech. Hospital
2. Total renovation & complete conceal wirings of
   i) G Type Qrts., 150 nos.
   ii) H1 Type Qrts., 40 Nos.
   iii) H Type Qrts., 20 Nos.
   iv) C Type Qrts., 25 Nos.
   v) C1 Type Qrts., 30 Nos.
   vi) B Type Qrts., 80 Nos.
   vii) A Type 19 Nos.
   viii) Bachelor Flat 72 Nos.,
   ix) Radar Flat 5 Nos.
   x) 1BR 30 Nos.
   xi) 2BR 25 Nos.
   xii) FA flats 10 Nos.
   xiii) FTA Qrts. 10 Nos.
   xiv) 2BRF 12 Nos.
   xv) ISRO flats
Hostels

1. Renovation & complete concealed re-wirings of 70 Nos. Zakir Hussain Flats
2. Replacement of 1400 Nos. Fans in various Halls of Residence.
3. Electrification in New Common Rooms of Azad, MS, RP, JCB, SN/IG Hall of Residences.
5. Replacement of 25 Nos. electric distribution old panels with new ones in various Halls of Residence.
6. Installation of Cable Tray System at VS & LLR Halls of residence.

On Going Projects

2. Installation of lightning protection using Early Streamer Emission Technology in the main Institute Building and IIT Tower.
4. Remote energy monitoring of residential quarters at IIT Kharagpur and replacement of old energy meter.
5. Re-arranging of distribution system including cable tray & new panels etc. in the Dept. of Chem. Engg. & Metallurgical Dept.
6. Renovation of the electrical system in the CWISS Building and old building.
As a part of the ongoing infrastructural development, various construction projects have been taken up by Estate Civil Head Office. Current status of those projects is as follows:

A. Students Accommodation  
The entire Lal Bahadur Shastri Hall of Residence with 667 rooms have been handed over. One more Block of Bachelor Flat has been renovated and handed over for use of Girl students.

B. Nalanda Classroom Complex  
44 class rooms have been handed over & Furniture etc. for 30 class rooms have been completed for use.

C. J.C. Ghosh Science Block & P.C Roy Laboratory Block  
Floor slabs for both the Blocks up to 5th floor is complete.

D. Residential Apartments for Faculty and Staff  
64 Nos. 1BR Flats have been handed over and occupied. 64 Nos. 2BR Flats have been handed over and occupied.

E. A. J. C. Bose Laboratory Complex  
Construction of extension portion is already over and 4 more laboratories have been handed over.

F. New Water Supply Project  
8.00 km. of pipelines have been laid. Construction at river bed is going on.

G. Construction of New Kendriya Vidyalaya  
Construction is already complete and area development has also been completed. The School is already shifted to the new location and functioning.

H. New Market Complex Behind B.C. Roy Hospital  
Four shops have been newly constructed and the old shops near Electric Overhead Office have been demolished. A new block has also been constructed.

I. Development of Children Parks at Campus  
Six children parks at Campus have been developed.

J. Expansion Work in Academic Buildings  
Entire Expansion work of Department of IE&M, Chemical Engineering and New buildings for Department of Mechanical Engineering and Computer Science & Engineering have been completed. Expansion work of Department of Biotechnology is going on.
Extra Academic Activities

This is the only Institute where EAA is included in the course curriculum at Undergraduate level (4 semesters in 1st and 2nd Year). It has 3 principal branches viz. NCC (Air Wing and EME), NSO (Various sports & games; Health & Fitness and Yoga) and NSS. Following is the brief report for the year 2012-13.

National Service Scheme (NSS), IIT Kharagpur

National Service Scheme at IIT Kharagpur comprises of about one thousand students from UG and seventeen faculty members drawn from various departments. It is divided into fifteen units and serve eighteen villages and slums in the neighbourhood. They are: Rakhalgeria, Rangametia, Malmar, Porapara, Gholgharia, Kashijora, Ayodhyagah, Salboni, Balarampur, Shyamaipur, Gaighata, Gangadharpur, Pariapara, Talbagicha, Ayma, Sonamukhi, Jhuli and Soladahar. NSS team enjoys the support from local people, panchayat members, BDO and SDO.

NSS volunteers are actively engaged with school students of villages / slums in complementing the education they receive in the school like exposure to spoken English, Vedic Math., Science and Nature etc. Thirteen primary schools and three high schools are visited by the volunteers every Saturday. Various competitions are held at school level and prizes are given to encourage students. Each primary school receives two and each high school receive four scholarships named PRERANA which is sponsored by our alumni who once were part of NSS, IIT Kharagpur. Each primary school was provided with water filter for safe drinking water.

NSS volunteers took up various village level works in different units during the year. These include: Facilitating cleaning of village wells, repairing defunct tubewells, cleaning of public monuments / place of worship, tree plantation, rally on dengue prevention, use of plastic and other health issues, street-play on social issues like child marriage, dowry, alcoholism, conduct of medical camp, computer education to village youth, providing sewing machine to village self-help group of lady members which was funded by office of Alumni Affairs. Clothes collected from campus community were distributed among the needy in four villages and more than five hundred people benefited.

In 12th January, 2013, Vivekananda’s birthday the NSS team brought out a morning rally. This being 150th birth centenary of Vivekananda there were rallies by NCC, campus residents. The Annual NSS Camp was held in the village Gholgharia during 29th Nov to 5th Dec. 2012 with more than 500 student-volunteers and 15 local youth. It was a great experience for all the campers to interact with the village community. Besides observance of Independence Day, Republic Day, NSS Day, and NSS Annual Function, it organized a Voluntary Blood Donation Camp with the help of Blood Bank, Sub-Division Hospital, Kharagpur and B. C. Roy Technology Hospital, IIT Kharagpur on 16th March, 2013. More than 100 students donated blood in the camp.

Health and Fitness, IIT Kharagpur

Health and Fitness program is an important component of Extra Academic Activity at IIT Kharagpur. This engages undergraduate students in first and second year in healthy exercises and promoting a healthy lifestyle. Currently, it serves about eight hundred fifty students who are divided in nine units. Every week, on Wednesday and Saturday, the students gather in the Jnan Ghosh stadium at sunrise. After brief warm-up, they participate in free hand exercise. There are short duration innovative field games everyday. The program ends with de-stretching and breathing exercise. As a part of promoting healthy life-style the team organized a huge rally. The theme was ‘anti-addiction’ and the student members designed many placards on that. It maintains a blog, a youtube channel and a website to encourage larger participation across boundaries. There are ten faculty members associated with this and this is ably supported by 3 Bengal Tech Air Sqn, NCC Wing and certain staff of Technology Students’ Gymkhana. It receives due support from Institute administration and the dedicated website was launched by Director, IIT Kharagpur. This activity had reinforcement in terms of overhaul of the program in Spring semester 2012-2013 and was found to be more effective among the student community with large increase in participation.
National Cadet Corps

1 Bengal EME Coy. NCC and 3 Bengal Tech Air Sqn NCC are the two units of NCC functioning at this Institute with more than 400 1st year and 2nd year undergraduate students. Besides regular training (training to “Gen – Next”; Soft Skills; Air mindedness, drills and parades etc.) it took up certain social service and community oriented programs like Environment conservation, Sadbhavana Run, Disaster Management, Anti Tobacco and Cancer awareness, Anti Dowry and Anti Female Foeticide, World AIDS awareness Day, Vigilance Awareness, Communal Harmony, National Youth Day, Thalassemia awareness, National Voters day, Conservation of Water body, Healthy Heart Day, World Forestry Day, Observance of Earth Hour. The units organized various Seminars and Workshops which include Environment Conservation and Waste Management; Aeromodelling Seminar; Workshop on Fire Fighting; Workshop on First Aid; Workshop on Air Traffic Control Tower and lecture on operation of an Air Force Base. It held NCC Examinations including ‘C’ Certificate Exam and ‘B’ Certificate Exam for Training Year 2012-13 as usual.

Major Achievement
Governor’s Medal (2012-13): A history in IIT Kharagpur was created when Cadet Sergeant Tippa Muniraja (11AE30016) of 3 Bengal Tech Air Sqn was awarded with Governor’s medal of West Bengal state on 07 Feb 2013.
Information Cell

Prof.-in-Charge
Prof. Balbir Kumar Mathur

The Information Cell has been the hub of academic information service of the Institute all round the year. In the past year, the Cell has renovated the web sites of the Institute and Online Notice-Board. The Cell also created and hosted sites of about forty conferences, seminars, workshops and short-term courses held during the past year and to be held in the next academic year. In addition to regular updating information on departmental pages, academic programmes, profiles of all faculty, halls of residences and administrative positions in the Institute

The Cell also developed additional information modules for in-house application and they can be used in any other academic organization as well. These are: on-line Faculty Self Appraisal Package, Departmental Report Package, Online Voting System, Guest House Booking Package, Extension of on-line Message Board facility to the Academic Section, Training and Placement Section and Doctorates Information System. In a major development of Guest House Management, all guest houses are brought under a common operating system and online booking facility has been extended to faculty. The Cell has made available the basic information about all Institute Staff on the LAN. The Cell has also developed software for various service sections for online filling of complaints.
Kalpana Chawla Space Technology Cell

**Head**
Prof. Dipanwita Roy Chowdhury

**Associated Faculty**
Dr. D. R. Chowdhury Ph.D, Cryptography and Security, VLSI
Dr. Somnath Sengupta Ph.D, Image & Video Processing
Dr. B. K. Sarkar Ph.D, RF & Microwave Engineering
Dr. S. Sanyal Ph.D, RF & Microwave Engineering
Dr. S. Chakraborti Ph.D, Communication
Dr. S. S. Bandyopadhyay Ph.D, Cryogenic Engg
Dr. K. Bandyopadhyay Ph.D, Satellite Communication
Dr. I. Manna Ph.D, Material
Dr. I. Sengupta Ph.D, Mobile Communication, VLSI
Dr. S. Banerjee Ph.D, VLSI based embedded system design for signal/image processing, Biomedical Instrumentation
Dr. T. K. Chaki Ph.D, Rubber
Dr. N V A Naikan Ph.D, Reliability and Quality Engineering
Dr. Sunando Dasgupta Ph.D, Microscale Transport Process and Microfluids
Dr. Ajay Chakrabarty Ph.D, EMI/EMC

**Associate Professor**
Dr. G. Saha Ph.D, Communication
Dr. C. Chakrabarty Ph.D, Control System
Dr. S. B. Sant Ph.D, Material
Dr. J. Datta Majumdar Ph.D, Nano fluid based
Dr. T. K. Bhattacharya Ph.D, RF MEMS
Dr. Raja Datta Ph.D, Optical & Wireless Network
Dr. D. Chakravarty Ph.D, Mining & Geostatics
Dr. B. Samanta Ph.D, Mining & Geostatics

**Assistant Professor**
Dr. M. Sinha Ph.D, Aerospace Engineering
Dr. A. Bhattacharya Ph.D, RF & Microwave Engineering
Dr. P. K. Chakraborty Ph.D, Solid-State Science and Technology
Dr. A. Mitra Ph.D, Nutraceuticals & herb based medicine/Diabetology, Drug encapsulation, Clinical Trials
Dr. Soumen Das Ph.D, MEMS & Microsystems
Dr. T. K. Nandi Ph.D, Cryogenic Engg
Dr. R. Roy Ph.D, Numerical Computation of Wave functions
Dr. D. Mukhopadhyay Ph.D, VLSI, Cryptology
Dr. M. K. Mondal Ph.D, Microwave circuits
Dr. Arijit De Ph.D, EMI/EMC, RF Microwave
Emeritus Professor
Dr. K. G. Naryanan Ph.D, Microwave Engineering

Chair Professor:
Dr. B. K. Sarkar Ph.D., RF & Microwave Engineering
Dr. K. Bandyopadhyay Ph.D., Satellite communication

Visiting / Adjunct Faculty
Dr. A. Bose M. E., Mechanical Engineering
Dr. S. Dasgupta Ph.D., Control System
Dr. B. B. Das Ph.D., Control System

Officer
Dr. Saswati Ghosh Ph.D., EMI/EMC, RF Microwave Circuit & Antenna
Mr. P. K. Guchhait M.Tech., Nano fluid

Faculty Appointed as Emeritus Professor:
Dr. K. G. Narayanan Professor

Research and Development

Brief description of on-going activities:
Space Technology Cell, IIT Kharagpur was renamed as Kalpana Chawla Space Technology Cell and was formally inaugurated by Chairman ISRO on 17th November 2004. This Cell has been functioning under the supervision of chairman of Space Technology Cell since June 1998. The Cell is being funded by ISRO, DRDO, CMPDIL Ranchi, etc. During the period under report the following highlights of sponsored research activities in this inside KCSTC and in different of departments of IIT

1. Dual Mode Ring Resonator Bandpass Filter with wide stopband
2. Design of Wide-band, Sharp-rejection Bandpass Filters with Parallel – coupled Lines
3. Compact Bandpass Filters with Wide Controllable Fractional Bandwidth
4. Analysis of linear tapered waveguide by two approaches
5. Compact Sharp cutoff wide stopband low-pass filter using defected ground structure and spurline
7. On An Algorithm for Boundary Estimation of Commonly Occurring Heart Value Diseases in Time Domain
8. Log Gabor Wavelet and Maximum a Posteriori Estimation in Speaker Identification
9. A Robust Heart Sound Segmentation Algorithm for Commonly Occurring Heart Value Diseases
10. An object based coding scheme for frontal surface of defective fluted ingots
11. A Hierarchical Framework for Generic Sports Video Classification
12. Texture Classification Using a Novel, Soft-Set Theory Based Classification Algorithm
13. Performance of high rate data in wideband CDMA with correlated interferers
15. Effects of correlated interferers on packet data in presence of voice in cellular CDMA
16. Resource allocation for data in presence of voice in cellular CDMA with correlated interferers
17. Estimation of Antenna Factor of Wire Antenna as EMI Sensor Fusion
18. An Evolutionary Algorithm based Approach to Automated Design of Analog and RF circuits using Adaptive Normalized Cost Functions
19. Image – based classification of Defects in Frontal Surface of Fluted Ingot
20. Impedance Calculation of Broadwall Longitudinal Slot on Rectangular Waveguide
21. Harmonic Suppression and Miniaturization of Microstrip Branch Line Couplers
22. Method of Moment Analysis of Arbitrary Length Longitudinal Slot on Broadwall of Rectangular Waveguides
23. Analysis of Longitudinal Slot Antennas in the Broadwall of Standard and Non-standard Rectangular Waveguides
24. Planar Compact, Wideband Bandpass Filters with Wide Upper Stopband
25. Estimation of EMI from Waveguide Joints and Analysis of Thick Rectangular windows and Open-end of a Rectangular Waveguide as EMI Sensors
27. U-Shaped microstrip structure to decrease DGS resonance frequency
28. Analysis of Wire Antennas as an Element in Reflect Array Antennas
29. Theoretical Investigation of Phase Control Using Variable Length Dipole and Loaded Dipole in Reflectarray Antenna
30. Monopole Antenna Loaded with Dielectric Resonator as EMI Sensor
32. Detection of Water Layer within the Earth Surface & Underground Coal Mines using Electromagnetic Wave
33. Imaging of Water Layer and buried object using Electromagnetic wave
34. Compact Wideband Bandpass Filters with Extended Upper Stopband
35. Harmonic Suppression and Size Reduction of Planar Branch Line Couplers
36. Method of Moment Analysis and Impedance Calculation of Broadwall Longitudinal Slot on Rectangular Waveguides
37. Compact Highpass Filter using Complementary Split Ring Resonator
38. Switched Beam Array Antenna for Sectorized Optimum Power Distribution into Discrete Localities of Rural Area
40. Multiple Beamforming using Switched Beam Array Antenna
41. Application of Multiple Cavity Modeling Technique for Accurate Analysis of Waveguide Fed Thick Rectangular Window
42. Comparison of IE3D and CST-Microwave Studio Simulator for Planar Microwave Filter design
43. Study on the Effect of Different Shapes of Defective Ground Structures Using Finite-Difference Time-Domain Technique
44. The role of GTD in the analysis and design of Antennas on shipboard platforms
45. A Wide-band Lumped Element Compact CAD Model of Si-Based Planar Spiral Inductor for RFIC
46. Design of a 1 V Low Power 900 MHz QVCO, 19th IEEE/ACM International Conference on VLSI Design
47. High Level Synthesis of Linear Analog Systems, International Conference on Emerging Applications of IT (EAIT 2006)
48. AGC of a Hydrothermal System with Thyristor Controlled Phase Shifter in the Tie-Line
49. Texture Classification Using a Novel, Soft-Set Theory Based Classification Algorithm
50. TEM Characterization of Polyester – Urethane – Clay (3 Weight%) nanocomposite
51. Improvement of performance of planner antenna using composite dielectric. EBG, RIS, SIAD structure are used for the improvement (Graind and Bandwidth enhancement, Miniaturization)
52. Efficient permittivity and permeability, slow wave structure and its application in electromagnetic wave propagation in media

i) Multimedia and Video Processing:
An FPGA – based state – of – the art video codec is being developed. The system under development finds its usage in Digital Video Broadcasting (DVB) system and performs real time encoding of colour videos frams size (352×288 pixels) at 30 frames/sec.

iii) Radiation patterns of antennas on satellite:
Radiation due antennas in free space can be readily computed and measured. However, when the antenna platform, that is the satellite structure need to be accounted for, then it becomes impractical to measured even in the must modern Anechoic Chambers of the world. Also, numerical techniques fail to predict the effect of the large structure on antenna radiation due to the limitations of computer memory and speed, even in today’s world. Hence,
analytical like STD needs to be developed for this purpose. This has been the field of study for the present investigator.

iv) **Monopulse Comparator:**
Design of highly compact comparator for monopulse radar application using reduced height Ku-band waveguided.

v) **DRA**
Design, Simulation and fabrication of CPW feed DRA to the narrow band application.

vi) **IRA (Impulse Radiating Antenna)**
Impulse Radiating Antenna is an UWB, directive and non-dispersive antenna. It was modeled and simulated using CST microwave studio and various parameters line Reflection Coefficient, VSWR, Gain, directivity and Radiation patterns were studied. A detailed study and simulations of various models for use of this antenna for high power applications was carried out.

vii) **MPCA**
Miniaturized Printed Circuit Antenna Design, Simulation and fabrication, Testing of Antenna for different Applications like Mobile, UMTS etc.

viii) **RFID**

ix) **MTMs**
Gain Enhancement of electrically small antennas using Metamaterials:- Design and Simulation of an electrically small antenna surrounded by Metamaterial shell/sphere.

x) **MOM**
Method of Moment (MOM) analysis, design, fabrication and testing of various types of waveguide slot excited Dielectric resonator Antennas (DRAs)

xi) **Electromagnetic Modelling of high frequency electronic systems to estimate EMC**
Electromagnetic interference is becoming a crucial issue in the design of modern high frequency electronic systems. In the conventional design methodology, EMC issues in the design of modern high frequency electronic systems. In the conventional design methodology, EMC issues are addressed only after a prototype is built. However, this process has a potentially significant impact on the cost and time – to – market of the products. This needs to develop an accurate and efficient electromagnetic analysis and modeling to analyze the performance of high frequency electronic circuits for verifying the design against all sorts of electromagnetic interference before fabrication. This has been taken up as the present work. Different conducting and dielectric bodies have been modeled using Method of Moments and the radiation and reception characteristic have been studied.

xii) **GPS**
Global positioning system (GPS), Adaptive Equalizer, Adaptive Array Antenna (Smart Antenna), Digital Signal Processing, Microwave Communication, Image processing & Numerical Techniques in Electromagnetic.

xiii) **Antenna Design**
Project title: Reduction of Mutual Coupling between microstrip antennas. Use Software: HFSS, CST

xiv) **Impulse Radiating Antenna (IRA)**
CST MS Software is being used to design and simulate an Ultra wideband Impulse Radiating Antenna (IRA), a TEM horn antenna (sensor), a 50 to 100 ohm impedance transformer and a splitter (50 ohm to 100 ohm coaxial cable) for differential feed to a full (4 arm) IRA.

xv) **Site-Specific Propagation Channel Modeling**
Our goal is to develop deterministic propagation channel model for micro and Pico cell scenario. Now-a-days, industry are using statistical channel modeling to characterize the wireless channel but following the reduction in call size, accurate characterization of channel becomes of vital significance. This leads to further investigation into the model which accurate, deterministic and amenable to industry requirement.

xvi) **Ka Band Propagation Channel Modelling for Satellite Communication System**
Communication systems, vapour, fog, oxygen, rain and several other gases which make up the air, cause propagation attenuation. Among these different atmospheric constituents, rain induced attenuation is the most severe, except for the degradation that occur near 22 GHz or 60 GHz die to vapour or oxygen. In particular, if a high frequency band of 10GHz and above is used the propagation attenuation due to rainfall is most dominant to overcome a signal degradation even on must either avoid it or compensate for it.
xvii) **Satellite Navigation**
Study and implementation of CDMA codes Binary offset carrier (BOC) modulation techniques and code tracking methods for Indian Regional Navigation Satellite Systems (IRNSS).

xviii) **Development of thiol terminated and PU polymers based nano composites adhesive for cryogenic propellant tank insulation applications**
The research work relates to the development of formulation of adhesive and coating nano compounds consisting of thiol terminated polymers and / or polyurethane polymers, filled with nanostructured materials and room temperature curators. These coating have barrier properties who find uses over cryogenic propellant tank multilayer layer – insulation.

xix) **Test Simulator for Satellite-based AIS**
The aim of the proposed system is to develop a test bed which deals with the possible challenges need to be overcome to successfully operate satellite based automatic identification system.
Satellite based automatic identification system is a unique way to monitor the vessel traffic movement by neighboring ships to avoid physical clash. An AIS receiver on a satellite may provide global or wide-region coverage and the monitoring can be extended to a central agency responsible for safety of vessels in territorial water. High carrier doppler, channel frequency shift, range variation play significant role in determining the satellite based receiver performance. The simulator is being built taking care of all these parameters which contribute to distortion in signal detection.

xx) **Digital Beam forming Techniques**
The project deals with formation of multiple beams by calculating the antenna weights in the receiver side. An algorithm has been proposed and the simulation results verifies the proposed method. However, further work is carried out so as to implement the proposed method in FPGA kit. A new hardware interface has been proposed that can serve as a junction between the RF section and the DSP kit. Validation of the emulated result with that of the simulation output is yet to be carried on.

xxi) **GNSS Signal Processing and Detection theory**
Global Navigation satellite system (GNSS) are Direct sequence spread spectrum systems (DSSS) used to spread the navigation message which serve as basic tool for measuring transmission time from satellite to receiver. The pseudo-ranges between satellite and user provides the satellite position and corrections required for increasing the pseudo – range precision. GNSS finds numerous civilian and Military applications. In this work, code optimization and signal detection are carried out.

xxii) **Microwave Imaging (MI)**
Microwave Imaging is a retrieval of object characteristics by analyzing scattered electromagnetic field from the object in the microwave region. The scattered fields from the objects are generated by incident electromagnetic fields from antennas which we placed around the objects. MI has wide range of applications in biomedical, Industrial, military, consumers etc.

xxiii) **Dielectric Resonator Antennas (DRA) Analysis**
DRAs are highly efficient, low profile and low loss radiating structures, which can be used in microwave and millimeter wave applications. Among various shapes of available DRA structures, rectangular DRAs (RDRA) are less analyzed despite their several advantages. This is due to the reason that rectangular structures are not formed as bodies-of-revolution (BOR) and hence its analysis is quite involved. In this work RDRA is analyzed using volume integration technique and its design and simulation is carried out in HFSS tool.

xxiv) **Filter design for satellite application**
Microstrip filters have found wide applications in many RF/Microwave circuits and systems. For the satellite communication, compact size and high performance are most desirable. Here a band pass filter whose frequency band can be tuned with the compactness in size will be analyzed and developed.

xv) **Theory of Characteristic Mode**
Theory of Characteristic Modes can be used to perform a systematic design of different types of antennas. However, this work shows that what makes characteristic modes really attractive for antenna design is the physical insight they bring into the radiating phenomena taking place in the antenna. The resonance frequency of modes, as well as their radiating behaviour, can be determined from the information provided by the
eigenvalues associated with the characteristic modes. For Analysis purpose MoM code has been developed in MATLAB platform using RWG basis function.

xvi) **Computational Electromagnetics:** (Method of Moments)
Microstrip Patch Antennas- Antenna Factor

xvii) **Cryptography and Security**

Xviii) **Design of UWB pulse generator and design of pulsed power amplifier**

b) **Thrust Areas**
1) Liquid Combustion, Propulsion and Cryogenics
2) Space Communications and EMI/EMC
3) Micromachine Sensors
4) Control, Navigation and Guidance
5) Embedded Systems and IP-Cores
6) Life Support Engineering
7) Smart Materials & Exotic Materials
8) Power Electronics
9) Space Education
10) Electronics Devices
11) Cryogenics

c) **New Acquisitions**
i) CST Software-Microwave studio, version-5
ii) IE3D – version – 9 by Zeland Software Inc.
iii) MATLAB
iv) WIPL-D
v) HFSS
vi) VCO-Model no – ZOS-1025, Freq. Range – 685 -1025 MHz

vii) LNA-

b) Model – ZHL – 0812 HLN, Freq. Range – 800 -1200 MHz
c) Model – ZHL – 2HAD, Freq. Range – 50-1000 MHz
d) Model – ZFL – 1000VH2, Freq. Range- 10 -1000 MHz

viii) Filters
a) LOW PASS FILTER:- Model.no- BLP-550, Freq. Range – DC-520
b) HIGH PASS FILTER : Model no- NHP-1000, Freq. Range-DC – 550

ix) Mixers:-
a) Model. No- ZLW – 2, Freq. Range – 685-1025MHz
b) Model.No. – ZEM-4300, Freq. Range- 300-4300MHz

SPONSORED RESEARCH *(Sponsored by ISRO-IIT Kharagpur Cell)*
1. Design of an Integrated code for Authentication and Error correction (AEC)
2. Test Simulator for satellite based AIS (TSS)
3. Design of radiation hardened data converters (HDC)
4. Design and Development of CMOS based 8 Bit 250 to 500 MSPS Analog to Digital and Digital to Analog Converter (DAC)
5. Silicon Carbide as high temperature MEMS and MOSFET devices (HTM)
6. FPGA-based design and development of H-264 codec (PGA)
7. KaBand Propagation Experiments over Indian Topical Region for Improvement of Ka Band Satellite Communication (KPE)


10. Enhancement of Transport Layer performance for Inter Planetary Network (ETP)

11. Design and Analysis of a Light Weight Cryptographic System on FPGAs (LCF)

12. Analysis and Design of wideband compact Rectangular Patch Antenna Embedded on Cylindrical Pin Structure (PIC)


15. Development of a MEMS based Assay for bio-medical diagnostics (ABD)

16. Nano-fluid Based coolant and combustion fuel system (NBS)

17. Study on Improvement of adhesion of EPDM based nanocomposites in solid Rocket Motor Thermal Insulation applications (MTI)

18. Interplanetary Satellite Orbit Determination Using Ground based Observations (ISD)

19. Synthesis of satellite footprint patterns from planar array antennas by combination of particle swarm optimization and fast fourier transform (SFP)

20. Analysis of different conducting and dielectric structures as EMI sensors (ADS)

21. Design & Development of High speed miniaturized RF MEMS switched capacitor (MSC)

22. Reliability Modeling Analysis and Prediction of 21NA (Absolute) Pressure Transducers (RAP)

23. Use of Hyperspectral remote sensing imagery for mineral identification and mineral potential mapping (HIS)

24. Testing and Characterization of In-house developed MEMS capacitive accelerometer (TCA)

25. Theoretical and Experiment Analysis of Evaporation in the Grooves of a Micro Heat Pipe (EGP)

26. Design and Development of Application tool for InSAR to Determine Ground surface Movement (ITG)

27. Studies on Retro-Directive Array for Space Applications

28. Model Based Error Concealments (SVD)

29. Studies on new modulation techniques for satellite navigation (NSN)

Publications and Distinctions of associated faculty are presented in their respective Departmental pages.
Rajbhasha Vibhag

Chairman
Prof. U. C. Gupta

Hindi Officer
Dr. Rajeev Kumar Rawat

On Going Activities of Vibhag

Translation

All the documents, correspondence, Institute's Annual Report and Annual Accounts statement are translated by Rajbhasha Vibhag apart from the routine translation of various technical / non technical documents, administrative orders and letters from English to Hindi and vice versa. In addition to the translation of documents, the Vibhag ensures the bilingual display of different nameplates, notice boards, rubber stamps, and preparation of Degrees / Diplomas certificates awarded by the institute.

Hindi Training

Rajbhasha Vibhag has initiated Hindi Training to Institute employees for Praveen and Pragya course under Hindi Teaching Scheme. The classes are arranged in Institute with the help of Sri K K Pathak, Hindi Pradhyapak, Hindi Teaching Scheme. Upto December 2012, 170 employees have been trained up to Pragya level.

Hindi Workshops and Seminars

With a view to create awareness for use of Hindi as Official Language in official work as well as to accelerate the pace of its progressive use, Rajbhasha Vibhag used to organize various training programmes, Workshops and Seminars for the employees / Officers of the Institute throughout the year. In the previous year 2012-13 the following events took place:-

On 20th May, 27th September, & 17th October, 2012, three Hindi workshops were organized for the employees. In these Dr. Rajeev Kumar Rawat, Hindi officer briefed the employees about the techniques for doing their day to day official work in Hindi and also hands-on training was given to them to be able to work on computer in hindi, noting and drafting.

Celebration of HINDI DIVAS

During the month of September, Rajbhasha Vibhag has organized "Hindi Saptah" from 12- 19th Sep 2012. Several programmes and competitions in Hindi were organised for employees and students of the Institute as well as for the students of nearby schools. Winners were motivated with certificates and cash prizes.

Publication

Rajbhasha Vibhag publishes a monthly News Magazine "Jharokha" in Hindi covering all the academic, cultural, extra-curricular activities of the institute with the rules, regulations, policy matters related to Rajbhasha.

Resources and Achievements

Softwares

Rajbhasha Vibhag has several Hindi Softwares like i-leap, ISM Publisher, ISM Office, Leap Office etc. Vibhag also uses the tools, PARIVARTAK, MANTRA, TRANSLITERATION, etc developed by Department of Official Language, MHA, Government of India, C-DAC and other agencies. Recently ISM V.6 was procured which is Unicode compatible.
UNICODE

The Vibhag has activated UNICODE in all the computers of departments and trained the employees to work in Hindi.

Rajbhasha Library

Rajbhasha Vibhag has a full fledged Library with a collection of more than 1200 books of different writers on literature, fiction, poetry, prose, play and various subjects of translation and language.

Bilingual web site

The Rajbhasha Vibhag has made its website bilingual. Useful information links are available on Vibhag Website regarding training programmes, incentives schemes, different tools etc. The Rajbhasha Vibhag has also made the Institute's website bilingual and efforts are being made to make the contents of the website also bilingual.

Committees

Official Language Implementation Committee and Progress Measurement Committee

The Institute has constituted two committees named as Official Language Implementation Committee (OLIC) and Progressive Measurement Committee (PMC) for the implementation of Rajbhasha Policies and monitors the progressive use of Hindi in the Institute in day-to-day work. A combined meeting of the OLIC and PMC is held quarterly and is chaired by the Director. This year the meetings were held on 25.06.2012, 27.09.12 and 12.03.2012 to discuss various issues. The Progressive Measurement Committee (PMC) inspects each department and monitors the progressive use of Hindi in the Department and submits the report to Director.

Town Official Language Implementation Committee (TOLIC)

In addition to this, Rajbhasha Vibhag, IIT Kharagpur plays a vital role in co-ordination for implementing the Official Language policy in the town. As the Director of the Institute is the senior most officer of Central government in Kharagpur, Rajbhasha Vibhag, Ministry of Home Affairs, Government of India has nominated him as Chairman of Town Official Language Implementation Committee (TOLIC). All the central government offices, Banks, Corporations, Autonomous bodies and enterprises are the members of TOLIC. At present there are 42 member Offices in the committee. The committee has been assigned the task of implementing the Rajbhasha policies and ensuring the orders and directives of government. The Director, Prof. D. Acharya has nominated Prof. U. C. Gupta, Chairman/Rajbhasha Vibhag as Executive Chairman and Dr. Rajeev Kumar Rawat, Hindi Officer as Member- Secretary of TOLIC to look after the routine work of committee. As per the calendar, the meetings of TOLIC Khargpur are fixed to be held in January and August. In the previous year two meetings were held on 10.10.2012 and 29.01.13. The meetings were chaired by the Chairman TOLIC and attended by Heads of the member offices with their Hindi Staff. Rajbhasha Vibhag invites the employees of TOLIC member offices to participate in the workshops, seminars and training programmes organized in IIT Kharagpur.
Science & Technology Entrepreneurs’ Park (STEP)

Prof-in-Charge
Prof. Dhrubes Biswas

Major Activities
(a) High end TBI lab with VLSI based equipments has been established to facilitate the entrepreneurs under TBI/STEP incubation.
(b) Infrastructure facilities created:
   (1) Construction of incubation facilities 13,500 sq ft is under process out of that 4500 sq ft is nearing completion at STEP Gopali.
   (2) A set of ten premium cubicles for the usage of Entrepreneurs have been established in the main building of STEP IIT Kharagpur.
   (3) The companies can access these cubicles and avail the facilities for their design and testing.
(c) A dedicated business development executive for STEP has also been recruited.
(d) Srishti 12: Science and Technology Entrepreneurs’ Park (STEP) IIT Kharagpur, Rajendra Mishra School of Engineering Entrepreneurship (RMSoEE) and Entrepreneurship Cell (E-Cell), IIT Kharagpur took a joint initiative for first year B-tech students of IIT Kharagpur to facilitate an opportunity for presenting their creative business ideas. The startup ideation contest “Srishti ‘12” was initiated with the primary goal to open a door to a new facet of exploration and exploitation. “Srishti ‘12” will encourage students to take their innovative ideas further as a new business.

The contest was conducted with objectives of

- Stimulating interest in entrepreneurship
- Provide individuals the opportunity to develop their ideas for new businesses
- Allowing the best ideas to be presented for financing further through TIDE activities
- Allowing the best submissions to win prize money for their idea
- Exposing individuals to the resources available that encourages entrepreneurship

This contest was conducted on November 12, 2012 in STEP IIT Kharagpur Avenue. We are looking forward to take this initiative further with a motive of encouraging students in the direction of entrepreneurship, innovation and promoting the entrepreneurial essence among the students of IIT Kharagpur.

(e) Entrepreneurs Meet cum Product Exhibition: On July 03, 2012 an entrepreneur’s meet cum product exhibition was organized at STEP, IIT Kharagpur. Chief guest Mr. S. Ramakrishnan, Regional Manager, SIDBI, inaugurated the programme. Mr. S. Ramakrishnan in the introductory session interacted with the incubatees about the guidelines and policies of SIDBI financial support. Prof. Dhrubes Biswas (MD, STEP), shared his experience and appreciated the step taken by the young entrepreneurs and innovators for their development. Mr. S. C. Santra (GM, STEP) explained the activities of the centre and support mechanisms for the grassroots entrepreneurs and innovators.

(f) FDP Programme: We have successfully conducted entrepreneurship (academics and practice) based two faculty development programme (FDP) in 2012-13. Fifty faculty members participated in FDP programme. The FDP participants were taught how to start E-Cell in their respective institution, how to create courseware on entrepreneurship, and how to promote entrepreneurial activity in their corresponding areas.

(g) The Global Entrepreneurship Summit (GES): The annual flagship event of E-Cell IIT Kharagpur unfurled in a grand style on 11 January 2013 as more than 2000 students from all over the country watched in awe. The GES summit 2013 witnessed workshops, interactive sessions and lectures from eminent personalities like Dr. Hande, Founder Selco Solar, Prof. Paul Lilrak, Alto University, Finland, Mr. Madan Mohanka, CMD of Tega Industries, Dr. B.S. Ajakumar among others. Professor Damodar Acharya, ex-director IIT Kharagpur, inaugurated the summit; Dr. Amarendra Mishra and Professor Devendra Mishra also were present. Dr Harish Hande and Professor Paul Lilrak were the keynote speakers for the inauguration ceremony. The three day conference served as a platform for
discussion of opportunities and programs for promoting entrepreneurship at IIT Kharagpur and in India on the whole and chalk out common strategies. The GES witnessed several programs and conclaves as well which were widely appreciated by the participants.

(h) Technopreneur Promotion Programme (TePP) - Product Exhibition: TePP project review held on September 06, 2012. Another TePP Product display took place on November 29, 2012 at STEP IIT Kharagpur which was inaugurated by Dr Ramanuj Banerjee, Scientist D, Department of Scientific and Industrial Research (DSIR), Government of India. The exhibition of products showcased innovations being carried with TePP, DSIR support and was participated by TePP innovators. The TePP innovators presented their innovations, which were widely appreciated by the visiting scientists and the professors.

(i) PAN IIT 2013 was held in Kolkata on December 2012. This was followed by IIT Kharagpur campus visit on 9th December 2012 by esteemed participants. The participants made it a point to visit the STEP/ RMSoEE campus and know firsthand the progress made by IIT-KGP in advancing entrepreneurship and innovation. The visitors which included the likes of Shri Arjun Malhotra, Co-Founder of HCL Infosystems and Ex-President, IIT-Foundation were highly impressed with the achievements and efforts of STEP IIT-KGP and appreciated Professor Dhrubes Biswas, MD STEP IIT Kharagpur and his team for their contribution.

(j) TIDE–DeitY Program Evaluation: A high level team from Department of Electronics and Information Technology (DeitY), Government of India, under the leadership of Dr. G.V Ramaraju (Scientist G) visited STEP IIT Kharagpur on January 09, 2013, to oversee and evaluate the progress made by TIDE entrepreneurs supported by DeitY. A formal presentation to the dignitaries followed by briefings about the funded companies was also made by the Prof. Dhrubes Biswas. The visiting team appreciated the progress made by IIT Kharagpur and the professionalism in overseeing the projects towards their success.

Research And Development

Thrust Areas of Research

TBI Research:

Following fields of development are well supported and bolstered by TBI (Test/Measurement, Design and Characterization lab)

- Embedded System Design & Development (High and Low End FPGA/DSP development board) for major below application.
  - Cordless phone
  - Component level design
  - RF MMIC design in High frequency applications
  - Automobile
- Wireless Communication
  - Satellite communication
  - ODU form S-Band to K band
  - Collision avoidance RADAR for automotive
  - Dual Band Radio
  - RFID
  - Search & Rescue transponder for civil application
  - Board level design
  - Optical communication
- Image Processing
  - New codec based video transfer technology
- Medical
  - Biometric passports
  - Active & Passive semiconductor devices design & Modeling
  - Low Noise receiver & Power amplifier
- Design & Development for medical instrumentation
Management Research

- Business Architecture/Business Networks for SME
- Information & Communication Technology (ICT) applications in Healthcare
- Technology Interventions of Growth Ventures
- The Education-Enterprise association for entrepreneurship through ideation, incubation and entrepreneurial integration
- Product Development Strategy for Startup Firm
- Business Intelligence for Entrepreneurial venture
- Quality of Service for SME

Research on Health Care Delivery model

- ICT based healthcare delivery model
- Integrated devices to capture real time data
- To provide services to the rural and semi urban sectors of India

Brief descriptions of on-going entrepreneurial activities at STEP

Total No. of companies: 61
STEP IIT Kharagpur Campus: 50
STEP Gopali Campus: 11

Companies at STEP IIT Kharagpur Campus

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Companies of STEP/TBI</th>
<th>Major Entrepreneurial Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old Companies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>M/s. Centre for Advanced Communication</td>
<td>Interactive Software Integrated Learning System (ISILS)</td>
</tr>
<tr>
<td>4.</td>
<td>M/s. ElectroSoft Consultants</td>
<td>Involved in several sponsored and consultancy projects</td>
</tr>
<tr>
<td>6.</td>
<td>M/s. Focus R&amp;D Pvt. Ltd.</td>
<td>Software Research</td>
</tr>
<tr>
<td>7.</td>
<td>M/s. KE Technical Textile Pvt. Ltd.</td>
<td>Control system design based facilities of weaving, processing and coating of fabric with various Polymers &amp; Resin systems</td>
</tr>
<tr>
<td>11.</td>
<td>M/s. Delta Electrical Industries</td>
<td>Green lighting manufacturing and</td>
</tr>
<tr>
<td></td>
<td>Company Name</td>
<td>Description</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>12.</td>
<td>M/s. Ikure Tech Soft Pvt. Ltd.</td>
<td>Health applications to facilitate the patient’s data delivery</td>
</tr>
<tr>
<td>16.</td>
<td>M/s. RISUG (Reversible Inhibition of Sperm Under Guidance)</td>
<td>RISUG is an injectable compound that partially blocks the vasa Differentia (tubes that carry sperm), providing effective contraception for up to 10 years per dose.</td>
</tr>
<tr>
<td>20.</td>
<td>M/s. People’s Advanced Communication Centre Pvt. Ltd.</td>
<td>Delivers multimedia content and interacting with the user.</td>
</tr>
<tr>
<td>21.</td>
<td>M/s. Abzooba India Infotech Pvt. Ltd.</td>
<td>They are focused on Smart Health Information Platform technology.</td>
</tr>
<tr>
<td>25.</td>
<td>M/s. Think Innventions Pvt. Ltd.</td>
<td>Provide simpler and cheaper digital pen technology solutions</td>
</tr>
<tr>
<td>28.</td>
<td>M/s. Univect Education Solution Pvt. Ltd.</td>
<td>Univect provides an e-learning curriculum and a product portfolio in synchronization with school curriculum</td>
</tr>
<tr>
<td>29.</td>
<td>M/s. Peobrics Software Pvt. Ltd.</td>
<td>End to end Business Solutions using a range of ERP, CRM and SCM</td>
</tr>
<tr>
<td>30.</td>
<td>M/s. Sisa Communication Pvt. Ltd.</td>
<td>Uninterrupted Video Messaging services</td>
</tr>
</tbody>
</table>

**New Acquisitions**

<table>
<thead>
<tr>
<th></th>
<th>Company Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.</td>
<td>M/s. Zreyas Technology Pvt. Ltd.</td>
<td>Software designing, development, customization, implementation and maintenance</td>
</tr>
<tr>
<td>32.</td>
<td>M/s. Advenio Solutec Pvt. Ltd.</td>
<td>Early detection of diabetes from retinal image processing</td>
</tr>
<tr>
<td>33.</td>
<td>M/s. Qarth Technologies Pvt. Ltd.</td>
<td>Mobile apps for easy payments</td>
</tr>
<tr>
<td>34.</td>
<td>M/s. Tradelab Software Pvt. Ltd.</td>
<td>Software solutions for channel marketing</td>
</tr>
<tr>
<td>Sl. No.</td>
<td>Companies of STEP Gopali</td>
<td>Major entrepreneurial activity</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>1.</td>
<td>M/s. Electro Thermal Insulation</td>
<td>In the field of Insulation wires and polymer insulations</td>
</tr>
<tr>
<td>2.</td>
<td>M/s. Sandhya Glass works</td>
<td>Glass cutting work, Design of glass mirrors</td>
</tr>
<tr>
<td>3.</td>
<td>M/s. Gulton Rubber works</td>
<td>Making of Risk husk rollers</td>
</tr>
<tr>
<td>4.</td>
<td>M/s. Balaji Mushroom</td>
<td>Engaged in the production of mushrooms</td>
</tr>
<tr>
<td>5.</td>
<td>M/s. Raghunath Fertilizer</td>
<td>Vermi-compost and organic vegetables</td>
</tr>
<tr>
<td>6.</td>
<td>M/s. Renuka Polymer</td>
<td>Rubber husk polishers for rice mills</td>
</tr>
<tr>
<td>7.</td>
<td>M/s. Ashtami Enterprise</td>
<td>Manufacturing the rubber works for industrial purpose</td>
</tr>
<tr>
<td>8.</td>
<td>M/s. Balaji Enterprise</td>
<td>Manufacturing the ball bearing assembly material for Tata Metallic’s.</td>
</tr>
<tr>
<td>10.</td>
<td>M/s. Dreamz Perfumes Pvt. Ltd.</td>
<td>Manufacturing of various perfumes</td>
</tr>
<tr>
<td>11.</td>
<td>M/s. Pine Electronics</td>
<td>Manufacturing of UPS batteries</td>
</tr>
</tbody>
</table>

**Companies at STEP Gopali Campus**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Companies of STEP Gopali</th>
<th>Major entrepreneurial activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>35.</td>
<td>M/s. Yotto Labs Pvt. Ltd.</td>
<td>Mobile &amp; tablet apps - interactive food menu</td>
</tr>
<tr>
<td>38.</td>
<td>M/s. Amnivor Medicare Pvt. Ltd.</td>
<td>Biomedical Applications</td>
</tr>
<tr>
<td>39.</td>
<td>M/s. In Tution E'Learning Pvt. Ltd.</td>
<td>Interactive online indexed video sharing platform students</td>
</tr>
<tr>
<td>40.</td>
<td>M/s. Aadhar Solutions Pvt. Ltd.</td>
<td>Technical consulting, ranging from development of software and hardware tools</td>
</tr>
<tr>
<td>41.</td>
<td>M/s. Biraja Infotech Pvt. Ltd.</td>
<td>Software designing, IT Solutions, Embedded System</td>
</tr>
<tr>
<td>42.</td>
<td>M/s. Ideaizfirst Marketing Services Pvt. Ltd.</td>
<td>Technical consulting for business</td>
</tr>
<tr>
<td>43.</td>
<td>M/s. Perceptivo Imaging Technologies Pvt. Ltd.</td>
<td>Technical Consulting for Business</td>
</tr>
<tr>
<td>44.</td>
<td>M/s. STEP - UP Career Builders Pvt. Ltd.</td>
<td>Technology Driven Education and Training</td>
</tr>
<tr>
<td>45.</td>
<td>M/s. Technoquips Separation Pvt. Ltd.</td>
<td>Technical consulting for business</td>
</tr>
<tr>
<td>46.</td>
<td>M/s. Drisyayon Education Pvt. Ltd.</td>
<td>Online Education with Authenticated Access</td>
</tr>
<tr>
<td>47.</td>
<td>M/s. Sencilo Technology Solutions Pvt. Ltd.</td>
<td>Designing and Development of Home Appliances for Automated Cooking by ICT Applications</td>
</tr>
<tr>
<td>48.</td>
<td>M/s. Green Think Agri Management Pvt. Ltd.</td>
<td>Agri Consultancy in the Field of Agri Input and Output</td>
</tr>
<tr>
<td>50.</td>
<td>M/s. Ecofrost Technologies Pvt. Ltd.</td>
<td>Micro scale solar power hybrid cold storage</td>
</tr>
</tbody>
</table>
Other Assistance of Entrepreneurial Activities:
- Entrepreneurship support through MSME grant.
  MSME IIT Kharagpur centre has funded 9 innovators.

Awards and Recognition to STEP Entrepreneurs
P2Power Solutions Pvt. Ltd.:
  I. Company’s flagship product icon has been selected as the top most techno innovation at the i3-
    India Innovation.
  II. Initiative Awards 2010, organized by DST, CII, and Agilent technologies.
  III. Recognized amongst the 15 technologies in India at the DST- Lockheed Martin India Innovation 
    Growth Programme 2010 organized by FICCI.
Intellisys Technologies Pvt. Ltd.: NASCOM listed the company twice as one of the most IT 
  innovative companies in India in the year 2005 & 2007.
Meridian Software Technology Pvt. Ltd.:
  I. Company’s flagship product icon has been selected as the top most techno innovation at the i3-
    India Innovation Initiative Awards 2010, organized by DST, CII, and Agilent technologies.
  II. Recognized amongst the 15 technologies in India at the DST- Lockheed Martin India Innovation 
    Growth Programme 2010 organized by FICCI
Ikure Techsoft Pvt. Ltd.:
  I. Recognized as top 100 Social Entrepreneurship technology Companies by Action for India Led 
    by Sam Pitroda , Advisor to PM
  II. Selected as top 2 companies for pitch presentation out of 29 companies in Healthcare at Action 
    for India
GreenHAT Ventures Pvt. Ltd.:
  I. Deals with IDP for Australia and US (6L+ worth).
  II. Order to conduct next fair for British council for Jun-Jul (8L+ worth)
RISUG:
  I. Homi Bhabha award
  II. ICMR award
  III. IMA award
  IV. IDPL award
Delta Electrical Industries: i3- India Innovation Initiative Awards 2011, organized by DST,CII
Advatech Healthcare Pvt. Ltd.: TIE (The Indus Entrepreneurs) has awarded Advatech Healthcare 
The Best Start Up Company of the year 2011

Collaborative Efforts

Both national and international partnership has been built keeping IIT-KGP’s interest in mind.

i. International:
  a. Center for Entrepreneurship and Technology, Berkeley, USA
  b. Jyvaskyla University, Finland with School of Business and Economics
  c. John Hopkins University Business School, Baltimore, USA
  d. Laval University, Quebec, Canada
  e. National Chiao Tung University, Taiwan,
  f. Advanced Technology Development Center, Georgia Tech,
  g. Atlanta Deming Center of Entrepreneurship,
  h. Colorado State University, Boulder, Colorado with Business School

ii. National:
  a. IIM Ahmedabad
  b. IIM Bangalore
  c. IIM Calcutta

Lecture By Visiting Expert:

A. IEEE President Dr. Peter W. Staeker visited in the month of July’12 and had an interactive 
   session with the UG, PG and research scholars over technological applications (ICT) to 
   minimise the healthcare challenges in rural and semi-urban area.
B. Mr. Venkatraman.S (IIM-C) has given lecture to the students of IIT Kharagpur on “Stock market and start up businesses” on August 7, 2012

C. Dr. Indrajit Mukherjee (XLRI) delivered lecture to IIT Kharagpur students on “Entrepreneurship in India: Prospects and Problems” on August 21, 2012.

D. Prof. CY Chang, Prof. Ed. Chang and Prof. Stela Wen of NCTU have visited IIT Kharagpur during August 22-24, 2012 for inaugurating NCTU centre at IIT Kharagpur. Conducted an interactive sessions with the IIT Kharagpur students (UG, PG and research scholars at the STEP conference room)

E. Dr. Mark Harris (InnovaVentures) visited the school on August 27-31, 2012 and interacted with the dual degree and doctoral students regarding their ongoing projects. He also delivered lectures on “Technology Entrepreneurship” as well as shared his own entrepreneurial journey.

F. Mr. Anjan Ghosh (IIM-C) addressed the combined classes to the dual degree and doctoral students and delivered lectures on award winning case “Entrepreneurship: A success story on September 4, 2012”.

G. Prof. Indrajit Dube Delivered a lecture on corporate governance to the STEP authority, UG, PG and research scholars on October 2012.

H. Prof. P. L. Narasimhan (IIT KGP-IEM) delivered lecture on how to enhance productivity in order to improve the operational performance to UG, PG and research scholars on October 2012.

I. Prof. M. Padmavati from RGSoIPL had delivered lecture on IPR to the potential student entrepreneurs of IIT KGP in the STEP conference room.

J. Prof. Rakesh Basant, Chairman at CIIE, IIM Ahmedabad had visited STEP, IIT Kharagpur on December 12, 2012 and interacted with the dual degree and doctoral students. He expressed his interest about the entrepreneurship and other incubation programs of STEP IIT Kharagpur. Prof Basant had long research discussion with doctoral students also.

K. Prof. Paul Lillrank (Aalto University, Finland) visited STEP, IIT Kharagpur in the month of January, 2013 and delivered lectures to the dual degree students on “Quality Management for Entrepreneurial ventures”.

L. PAN-IIT 2012 portfolio members Mr Aniruddha Roy and Mr Pralay Guha visited STEP IIT Kharagpur on February 2013 to explore out opportunities for possible collaboration in the health care project.

SEMINARS/WORKSHOPS/CONFERENCES:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Seminars / Workshops / Conferences / Symposia</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Entrepreneurs meet</td>
<td>July 03, 2012</td>
</tr>
<tr>
<td>2</td>
<td>TePP Project Review</td>
<td>September 06, 2012</td>
</tr>
<tr>
<td>3</td>
<td>SRISHTI 12</td>
<td>November 12, 2012</td>
</tr>
<tr>
<td>4</td>
<td>TePP Product Exhibition</td>
<td>November 29, 2012</td>
</tr>
<tr>
<td>5</td>
<td>FDP</td>
<td>December 10-23, 2012</td>
</tr>
<tr>
<td>6</td>
<td>GES (Global Entrepreneurship Summit)</td>
<td>January 11-13, 2013</td>
</tr>
<tr>
<td>7</td>
<td>FDP</td>
<td>February 04-18, 2013</td>
</tr>
</tbody>
</table>
The synthesis of teaching and research is fundamental to IIT Kharagpur. IIT Kharagpur is highly rated for the quality and breadth of its research enterprise, for the innovation of its faculty, for the excellence of its Ph.D programs, and for the amount of funding received in support of its research initiatives. We are particularly noted for our openness to multidisciplinary research, and several new initiatives expand a long IIT Kharagpur tradition of cross-disciplinary research and collaboration. Today, our faculty and researchers in energy and the environment are exploring the development of renewable technologies to enable us to coexist with a bio-diverse planet. Through computation and information technologies, IIT Kharagpur researchers are deepening our comprehension of a multi-faceted world. Our research groups in nanotechnology and microscale processes are enabling the development of new materials and methods that support a safer, more cost-effective, and sustainable environment. The impact of our research ripples through India and around the world. IIT Kharagpur’s research programs reach across the campus and beyond, linking together 19 departments, 16 academic centers and a large number of advanced R&D laboratories, stimulating the integration of inquiry, new knowledge, and education.

Today, our faculty and researchers in energy and the environment are exploring the development of renewable technologies to enable us to coexist with a bio-diverse planet. Through computation and information technologies, IIT Kharagpur researchers are deepening our comprehension of a multi-faceted world. Research in biological and related areas focuses on the interface of biosciences and bioengineering in diverse and multidisciplinary areas such as biochemistry, molecular biology, physiology, cell and developmental biology, tissue engineering and bioinformatics. Our research groups in nanotechnology and microscale processes are enabling the development of new materials and methods that support a safer, more cost-effective, and sustainable environment.

Some of the noteworthy research initiatives and collaborative research facilities in recent years include:

- Centre for Railway Research
- P. K. Sinha Centre for Bioenergy
- Steel Technology Center
- R&D Center in collaboration with DVC
- Tea Engineering Research Center
- Centre of Excellence in Information Assurance
- National Program in Marine Hydrodynamics
- Vodafone-Essar-IIT Kharagpur Centre of Excellence in Telecommunications
- National facilities for EPMA
- Rural Technology Action Group (RUTAG)
- General Motors Collaborative Research Program
- Advanced VLSI Design Laboratory
- Research Laboratory in Electronics Controls and Software

In the past year IIT Kharagpur has received a number of high-value and flagship projects from the government and the industry such as,

- Online monitoring system for OHE traction parameters by RDSO, Lucknow
- Design & development of an on-board intelligent embedded platform for detection of weak failure modes and prognosis of severe faults in locomotives and associated equipment by RDSO, Lucknow
- Preparation, characterization and performance of functionalized membrane with improved anti-fouling properties by BRNS, DAE, Mumbai
- Thermomechanically processed high strength bainitic steel rails for Indian Railways by RDSO, Lucknow
- Aerodynamic design of traction rolling stock with speed potentials of 250 km/h upgradeable up to 350 km/h by RDSO, Lucknow
- Teachers empowerment, student empowerment and integration of tools for improvement -synchronous delivery (talk to a teacher) by MHRD, New Delhi
• Studies on shrinkage swelling characteristics of some Indian coals to ascertain recoverability of CBM from deep seated coal and shale resources by CMPDI, Ranchi
• Development of rubber compound and repair techniques for trailing cables of underground mining machines, by CMPDI, Ranchi
• Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning ice - main phase by MHRD, New Delhi

Besides these newly initiated research projects, IIT Kharagpur has been engaged in a number of ongoing innovative and socially relevant funded research activities. A partial list of which includes the following:

• Scientific evaluation of high voltage insulator conditions/predictions of residual life of composite insulators by RDSO, Lucknow
• Total synthesis of mayamycin, a c-glycosidic angucycline by SERB, New Delhi
• Smart nano-sensors for medical, coal mine and environmental monitoring by SERB, New Delhi
• Development of composition and standardization of properties of composite brake blocks for application in coaches of Indian railways by RDSO, Lucknow
• Experimental & numerical studies on deep excavation under static & seismic conditions by SERB, New Delhi
• Novel polymeric composite membranes for selective separation of gas mixtures by SERC, New Delhi
• Development of microbial fuel cell for direct electricity recovery during waste water treatment by SERC, New Delhi.
• Development of expert system for Indian blast furnace by Ministry of Steel, New Delhi.
• Aakash Development Laboratory (AADL) at IIT Kharagpur by MHRD New Delhi.
• Catalytic hydrolysis by a microbial enzyme with potential of an antibiotic target by DST, New Delhi
• Suspension and bogie technology for high speed trains by RDSO, Lucknow.
• Supporting consolidation, replication and upscaling of sustainable waste water treatment and reuse technologies for India (sarawati) by DST, New Delhi.
• Fast fixed point algorithms for identifying alertness and emotions, Sumsung, Korea.
• Development of technology and prototype facility for enhancement of shelf life of fruits and vegetables through active packaging & modified atmosphere storage by DBT, New Delhi.
• Involvement of functional single nucleotide polymorphisms (SNP) of matrix metalloproteinase (MMP) gene promoters in the cell type specific regulation of human MMPs: intrinsic genetic characteristics in cancer cell progression by DBT, New Delhi.
• Development of pilot scale palletisation technology for Indian geothitic/hematite ore with varying degree of fineness by Ministry of Steel, New Delhi.
• Tracking of ultrasonography machines towards prevention of its misuse by Ministry of Health and Family Welfare, New Delhi.

During the year 2012-2013 the Institute received from the Government, private and international funding agencies/enterprises 145 research projects for a total value of Rs. 129.87 crores and 151 consultancy projects worth Rs. 14.5 crores aggregating a total of 296 projects for Rs. 144.37 crores.

The Intellectual Property Rights and Industrial Relations (IPR & IR) Cell under SRIC is responsible for the licensing and the transfer of technologies developed by researchers at IIT Kharagpur to the commercial sector. Till date, more than 400 patents were filed and more than 120 were granted and a total of 19 technologies were transferred. This year IPR&IR Cell under SRIC carried out unique drive – 100 Days 100 Patents. The Institute Faculties, students and staff supported and responded whole heartedly and more than 200 abstracts were received and finally more than 100 patent applications have been sent out to patent attorneys for the filing applications to patent office.

The Entrepreneur Cell under SRIC supports a variety of incubation programmes funded by the Government.

Students are encouraged and supported to take up innovative challenging problems. One of the examples is TeamKART under Formula Student. Formula Student (FS) is Europe's most established educational motorsport competition, run by the Institution of Mechanical Engineers. It seeks to challenge university students to conceive, design, build, cost, present and compete as a team with a small single-seat racing car in a series of static and dynamic competitions. Recently IIT Kharagpur team has participated in Silverstone track in UK.

Technology Transfer Group (TTG) is a students' initiative under the aegis of SRIC, IIT Kharagpur, which believes in the potential of the Institute as a premier Research & Development centre. TTG acts as a link between the industry and the academia to facilitate transfer of industry ready technologies and presenting IIT Kharagpur as a research consultant. TTG also organized TEDx IIT Kharagpur event on the theme – The Unturned Page. The event hosted eminent speakers such as Professor Sugata Mitra, Mr. Shubhranshu Choudhary, Mr. Kailash Satyarthi, and Mr. Aniruddha Sharma who mesmerized the IIT community by sharing their experiences.
Technology Students Gymkhana

**President**  
Manish Bhattacharjee

**Physical Training Instructor**

- Mondal. S  
  B.A, M.P.Ed, Diploma in Sports Coaching in Basketball from NSNIS, Ph.D perusing, Qualified (BFI) National Referee ‘A’ Class.

- Kumar S.  

- Ghosh .A. K.  
  B.A. B.P Ed, Sports Coaching in Football from NSNIS, Kolkata.

- Gyan .S  
  B.P.E, M.P.E, M.Phil, Ph.D, Diploma in Sports Coaching in Hockey from NSNIS, Qualified National Referee.

**Developments**

- New Electric illumination facility at Cricket nets at TSC.
- New Electric illumination facility at Football Ground at TSC.

**Facilities**

- Modern Gymnasium
- Billiards
- Athletics Stadium
- Two Cricket Fields with two turf wickets. Jogging track along with modern practice facilities in Tata Steel Sports Complex
- Six Tennis Courts including four flood light Courts
- Three flood light Basketball (Cemented) Courts
- Three flood light Volleyball Courts
- Four wooden Badminton Courts
- Table Tennis room with four tables
- Yoga room
- Standard Swimming Pool
- One Squash court

**Activities**

**Inter IIT Sports Meet**

IIT Roorkee was host of 48th Inter IIT Sports Meet. The first phase of Sports Meet began with the Inter IIT Aquatic meet held during the period October 2nd to 5th, 2012. IIT Kharagpur secured 1st in Swimming and 3rd in water polo. Darshan Varriar, a final year UG student was the individual champion of the meet.

The second phase which includes all other games, started from December 17th to 24th, 2012. The men section IIT Kharagpur secured second position in lawn tennis, 3rd in volleyball, 4th in athletics and the women section first in athletics and first in lawn tennis. Mr. Inter IIT position was secured by Nitish Balal of IIT KGP.
All India invitation Sports Competition- Shaurya

Technology Students’ Gymkhana was conducted all India invitation College Tournament from 12th October to 14th October-12, following events have been organized: Athletics, Basketball, Badminton, Cricket, Football, Hockey, Table Tennis, Lawn Tennis, Volleyball.

Inter Hall Competition in Sports & Games:
During the autumn semester inter hall competition started with the inter hall athletics championship and Rajendra Prasad hall of residence won the championship, 2nd position secured by Nheru hall of residence and 3rd position was secured by Patel of residence.

In the spring semester the second phase of inter hall competition were held in badminton, basketball, cricket, football, hockey, volleyball, table tennis, lawn tennis, squash, weight lifting. Patel Hall won the General Championship with 74 points, Nheru hall secured second position with 61 points and third position was secured by Radhakrishnan hall with 49 points.

The inter hall competitions among the girl’s hostels were conducted in athletics, basketball, badminton, table tennis, lawn tennis.

Gymkhana Awards

During the annual prize distribution and farewell function, 13 Institute blues, 11 Order of Merits, 25 Honorable mention and 14 Special mention have been awarded to the students for their outstanding achievements in Sports & Games, Social & Cultural and Technology activities.

Inter Hall Competition in Social Culture Events
As usual the inter hall competition in various social & culture event were organized. The traditional inter hall Illumination & Rangoli competition was organized.

Inter Hall Competition in Technology

Major Events Organized

SPRING FEST 2013
The Spring fest 2012 was organize during January 23rd to 26th, 2013. This year students from colleges from various parts of country participated.

KSHITIJ 2013
The Annual Tech Fest Kshitz’12 was organized during 1st February to 4th February, 2013.
Technology Telecom Centre

Prof-in-Charge
Prof. Raja Datta

Engineer
Mr. Pankaj Gupta

Work Carried Out

- A 48V/300A power system has been installed along with 48V/1000AH battery bank to provide the redundancy to the power system thus making it robust as well as increasing the backup time.

- An automatic alarm system has been installed interfaced with GSM to send SMS as well call to the predefined numbers at the time of failure of AC power/ restoration of power as well as voltage drop in the battery bank.

- A software of mobile integration has been installed in the EPABX which forwards the incoming calls to the extension to predefined mobile phone, in case the extension does not lift the phone during the predefined fixed time.

- The Restructuring of internal cabling in the main building is completed.

- The new telephone cable has been laid to the old building to replace the old and damaged lead cable as well as to provide the connections in the sheds behind the old building.

- The telephone cable has been laid to the newly built Mechanical workshop.

- The internal telephone wiring work has been completed in the new building of Dept. Of Computer Science & Engg.

- The restructuring as well as of maintenance work of the telephone cables completed in the old A type qtrs.

- A new EPABX has been installed at the Kolkata Extension Centre along with the associated cabling work.

- The Airconditiner m/cs has been installed in Exchange room and in power room to provide ambient temperature for the smooth running of equipments.

Ongoing Works:

- The tender process is going on for the restructuring of telephone cables in Dept. Of Chemical Engg and Dept. Of Geology and Geophysics.

New Planning:

- The phase wise restructuring as well as maintenance of telephone cables inside the academic campus.

- Provide the telephone connections in every room of VGH.
Training & Placement Section

Professor in charge
Dr. Sudhirkumar Barai

Placement Details

The Training and Placement Section is responsible for arranging practical training for 3rd year students and job placement of final year students graduating from the Institute. The Section is actively engaged in forging synergistic relationships between the Institute and various industries and user systems of technical and scientific manpower. Based on these interactions, the T&P Section gives feedback to the Institute on the academic programmes.

A total of 3500 companies/organizations in India and abroad were contacted for placement at IIT Kharagpur. Two hundred and three (203) companies/organizations visited the campus for recruitment. Additionally, Ten (10) companies preferred to have telephonic interviews, videoconference interviews and personal interviews at their offices premises during 2012-2013. The details of number of students who had registered for placement and those actually placed through campus interviews including those who expected to have opted for higher studies/got jobs through off campus as on 13.05.2013 are as follows:

<table>
<thead>
<tr>
<th>Course/Degree</th>
<th>No. of students registered</th>
<th>No. of students placed</th>
<th>In percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.Tech. (Hons.)</td>
<td>506</td>
<td>446</td>
<td>88.14</td>
</tr>
<tr>
<td>B.Arch. (Hons.)</td>
<td>21</td>
<td>17</td>
<td>80.95</td>
</tr>
<tr>
<td>5-year M.Sc.</td>
<td>121</td>
<td>94</td>
<td>77.69</td>
</tr>
<tr>
<td>2-year M.Sc.</td>
<td>114</td>
<td>91</td>
<td>79.82</td>
</tr>
<tr>
<td>Dual Degree (B. Tech + M.Tech.)</td>
<td>289</td>
<td>262</td>
<td>90.66</td>
</tr>
<tr>
<td>M.Tech./MCP/MMST/LLB/MHRM</td>
<td>724</td>
<td>452</td>
<td>62.43</td>
</tr>
<tr>
<td>M.B.M.</td>
<td>101</td>
<td>89</td>
<td>88.12</td>
</tr>
<tr>
<td>Ph.D./MS</td>
<td>40</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>1916</td>
<td>1491</td>
<td>77.82</td>
</tr>
</tbody>
</table>

Summer Training

Eight weeks of summer practical training at the end of 3rd year B. Tech/Dual Degree and 4th year M.Sc. degree is a compulsory part of the curriculum at IIT Kharagpur, carrying 2 credits. All efforts are made to place the concerned students in the best of organizations in India and abroad for summer training through Training and Placement section and various departmental supports. An emergent trend is that more and more students are seeking summer training abroad.

A total of 1400 companies/organizations in India were contacted for training facilities for the current summer vacations in May-July 2013. Among these 110 in India had offered training facilities, out of which 45 organizations had extended out-of pocket allowances (covering 270 students) and many other extended subsidized transport, subsidized canteen, subsidized accommodation and to-and fro travel expenses (e.g. 3AC fare, air fare etc.) for our students. The highest out of pocket allowance of Rs. 60,000/- per month was paid by ITC Ltd. and Hindustan Unilever. Some other organizations such as GIDA offered Rs 52,500/- per month, Times Internet and American Express offered Rs. 50,000/- per month, Directi offered Rs. 45,000/- per month, Google, Amazon and Adobe offered Rs. 30,000/- per month, Yahoo, Qualcomm, and Microsoft offered Rs. 20,000/- per month. There are about fifteen (15) companies like Shree Cement, Tega Industries, Reliance India Limited, Infosys, Tata Motors, Siemens, Tata Steel, Schlumberger, Goldman Sachs offered stipend in the range Rs. 10,000/- to 20,000/- per month. Around fifteen companies offered below Rs. 10,000/- per month. In addition to the above some students arranged internship by themselves with good amount of stipend.
Out of 1180 third/fourth year B.Tech/Dual Degree/M. Sc. students, 90 students have taken up summer internship abroad in many Institutes/organizations likes EPFL, Switzerland, University of Warwick, Deakin University, Australia, National University of Singapore, Memorial University, Canada University of Tokyo, Max Plank Institute for Software Systems, Germany University of Alberta, Biotechnology & Bio Chemical Engineering, Belgium Iowa State University, U.S.A., Rice University, Technical University of Berlin, Kyoto University, Japan, Rhinewall University, Germany University of Freiburg, University of Machigan, University of Hagen, University of Leeds, Bremen University Dong A University, Busan, Stanford University etc. and foreign companies like Finisar, Malaysia, Mitsubishi, Works Application, Japan, ST Engineering Marine Ltd., Singapore during May-July, 2013.

**Student Participation**

To harness the student power, a formal system of student participation in the process had been initiated during 2005-06. This has evolved and the 2012-13 placements saw students participating in running placement process. In fact, through this participation it was possible to run up to FOURTEEN/FIFTEEN companies per day and round the clock. Students take active part in calling up companies and managing the logistics of placement.
Water Works Section

Professor –In-Charge
Professor Ashok Kumar Gupta

Executive Engineer
Shyamal Kumar Biswas,

On-going works / Job

1. Annual repair and maintenance in connection with plumbing and water supply at Academic Campus for the year 2012-13
2. Annual repair and maintenance in connection with plumbing and water supply at Old Residential Campus for the year 2012-13
3. Annual repair and maintenance in connection with plumbing and water supply at New Residential Campus for the year 2012-13
4. Annual repair and maintenance in connection with plumbing and water supply at VS, BC Roy, MS, RK, RP, Gokhale, AM, SN&IG, MT, RLB Halls for the year 2012-13
5. Annual repair and maintenance in connection with plumbing and water supply at MMM, Patel, Azad, Nehru, HJB, JCB, LLR Halls for the year 2012-13
6. Annual maintenance of main water pipelines from Anicut & Balarampur Pumphouse for the year 2012-13
7. Operation & maintenance of Iron Removal Filters for the year 2012-13
8. Cleaning & washing of water tanks at campus for the year 2012-13
9. Operation & maintenance of Balarampur Pumphouse for the year 2012-13
10. Construction of new rising main for Gas Godown Overhead tank.
11. Providing kitchen sink at H, H1 and G-type quarters of Dandakaranya and Dolpark area.
12. Providing new flushing cistern at H, H1 and G-type quarters at Dandakarayana area and H type of Dolpark area.
13. Water connection for newly constructed Kendriya Vidyalaya
14. Construction of two nos. mini deep tube well at Anicut Pumphouse
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Course</th>
<th>SANCTIONED STRENGTH</th>
<th>ADMISSION OFFERED</th>
<th>ACTUALLY REGISTERED</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>GN</td>
<td>OB</td>
<td>SC</td>
</tr>
<tr>
<td>(A)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B.TECH. 4-YEAR</td>
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<td></td>
</tr>
<tr>
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<td>16</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Agril. &amp; Food Engg.</td>
<td>17</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Biotech. &amp; Bioch. Engg.</td>
<td>14</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Chemical Engg.</td>
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<td>8</td>
</tr>
<tr>
<td>5</td>
<td>Civil Engg.</td>
<td>31</td>
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<td>9</td>
</tr>
<tr>
<td>6</td>
<td>Computer Sc. &amp; Engg.</td>
<td>28</td>
<td>15</td>
<td>8</td>
</tr>
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<td>Electrical Engg.</td>
<td>28</td>
<td>15</td>
<td>8</td>
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<td>17</td>
<td>9</td>
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<tr>
<td>9</td>
<td>Industrial Engg.</td>
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<td>4</td>
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<td>10</td>
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<td>5</td>
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<td>11</td>
<td>Manuf. Sc. &amp; Engg.</td>
<td>15</td>
<td>8</td>
<td>4</td>
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<tr>
<td>12</td>
<td>Mechanical Engg.</td>
<td>34</td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>13</td>
<td>Met. &amp; Mat. Engg.</td>
<td>22</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>14</td>
<td>Mining Engg.</td>
<td>20</td>
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<td>6</td>
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<td>15</td>
<td>Ocean Engg. &amp; N.A.</td>
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<td>9</td>
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<td><strong>Total (A)</strong></td>
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<td>330</td>
<td>178</td>
<td>97</td>
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Table A-1 (Continued)

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<tr>
<th>Sl. No.</th>
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<th>ACTUALLY REGISTERED</th>
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<td>5</td>
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<td>18</td>
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<td>63</td>
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## Table A-1 (Continued)

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<th>ACTUALLY REGISTERED</th>
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<td>Aerospace Engg.</td>
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<td>AG &amp; F.E./Water Res. Devel. &amp; Management</td>
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<td>Biotech. &amp; Biochem. Engg.</td>
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<tr>
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<td>Chemical Engg.</td>
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<td>4</td>
</tr>
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<td>Civil engg./Struct. Engg.</td>
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<td>3</td>
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<td>Computer Sc. &amp; Engg.</td>
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<td>3</td>
</tr>
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<td>8</td>
<td>E&amp;ECE / Auto. &amp; Comp. vision</td>
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<td>6</td>
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<td>Industrial Engg. /IEM</td>
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<td>Manuf. Sc. &amp; Engg./IEM</td>
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<td>7</td>
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<td>Mining Engg.</td>
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<td>5</td>
<td>3</td>
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<td>Mining Engg. / Safety Engg. &amp; Disaster Mgt. in Mines</td>
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<td>QED&amp;M</td>
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<td>2</td>
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</tbody>
</table>

**Total (D)** | 206 | 108 | 62 | 30 | 406 | 198 | 112 | 62 | 30 | 402 | 194 | 111 | 61 | 29 | 395 |

**Total (A + B + C + D)** | 677 | 362 | 201 | 101 | 1341 | 662 | 368 | 201 | 102 | 1333 | 644 | 350 | 192 | 99 | 1285 |

* One supernumerary in each course
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Course</th>
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<th>REGISTERED</th>
<th>NOT REGISTERED</th>
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<td>SC</td>
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<td>2</td>
<td>3</td>
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</tbody>
</table>
Table A-3
DISCIPLINE-WISE BREAK-UP OF STUDENTS AWARDED M.C.M. SCHOLARSHIP 2012-2013
Rate of Scholarship : Rs.1000/- p.m. plus Free-tuitionship(Applicable for Genl. & OBC students only)

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Course</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; yr.</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; yr.</th>
<th>3&lt;sup&gt;rd&lt;/sup&gt; yr.</th>
<th>4&lt;sup&gt;th&lt;/sup&gt; yr.</th>
<th>5&lt;sup&gt;th&lt;/sup&gt; yr.</th>
<th>Total</th>
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</thead>
<tbody>
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<td>(A)</td>
<td>B.Tech. 4-Year</td>
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<td>04</td>
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<td>-</td>
<td>27</td>
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<tr>
<td>2</td>
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<td>11</td>
<td>07</td>
<td>06</td>
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## STUDENTS AWARDED ONLY FREE TUITIONSHIP 2012-2013

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Rate: Pocket Allowance Rs.250/- p.m. plus Free Messing

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(E) Dual Degree 5-Year
Table No. 6

MEDALS AND PRIZES : 2012-2013 : UNDER-GRADUATE

1. INSTITUTE GOLD MEDALS :

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<td>Utsav Banerjee</td>
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D. M. SC. (5-YEAR) COURSES:

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<th>CGPA</th>
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<td>Namita Pahwa</td>
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<td>Dhanasetty Archana</td>
<td>08GG2019</td>
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### 4. ENDOWMENT PRIZES - (UNDER GRADUATE)

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<th>Instt Roll No.</th>
<th>CGPA</th>
<th>Amount Rs.</th>
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5. **J.C. GHOSH MEMORIAL PRIZE**

<p>| 1 | Aerospace Engineering | Bhatt Mrugank Pranav | 10AE10006 | 8.88 | 2,000.00 |
| 2 | Agricultural &amp; Food Engineering | Mallika Prasad | 10AG30018 | 8.83 | 2,000.00 |
| 3 | Biotechnology &amp; Biochemical Engg | Vinay Patel | 10BT10028 | 8.89 | 2,000.00 |
| 4 | Chemical Engineering | Kanjakha Pal | 10CH10060 | 9.23 | 2,000.00 |
| 5 | Civil Engineering | Saikat Dan | 10CE10046 | 9.09 | 2,000.00 |
| 6 | Computer Science &amp; Engineering | Yelam Anil Kumar | 10CS10056 | 9.58 | 2,000.00 |
| 7 | Electrical Engg | K. Nagaraju | 10EE10059 | 9.30 | 2,000.00 |
| 8 | Instrumentation Engineering | Sharvashish Das | 10IE10023 | 8.87 | 2,000.00 |
| 9 | Industrial Engineering | Dhawal Thakkar | 10IM10014 | 9.27 | 2,000.00 |</p>
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6. **BEST PROJECT AWARD:**

A. **4-YEAR B. TECH.(HONS.) COURSES:**
### B. 5-YEAR B. ARCH. (HONS.) COURSE:

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### C. 5-YEAR DUAL DEGREE COURSES:

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<th>Amount Rs.</th>
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<td>Computer Science &amp; Engineering (CS2)</td>
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### D. 5-YEAR M. SC. COURSES:

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### TABLE – B-1 ADMISSION TO POSTGRADUATE COURSES IN 2012-2013

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**TABLE: C-2a**

NUMBER OF POST DOCTORAL FELLOWS AS ON 30-06-2013

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## Receipts for the Year Ended 31st March’2013

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<th>Sl.No</th>
<th>Receipts</th>
<th>Current Year (2012-2013)</th>
<th>Previous Year (2011-2012)</th>
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<tbody>
<tr>
<td>I.</td>
<td>Opening Balance (Bank Balances)</td>
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<tr>
<td>a) In Current Accounts</td>
<td>194759252</td>
<td>2335104</td>
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<tr>
<td>b) In Savings Accounts</td>
<td>711995687</td>
<td>988176421</td>
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<tr>
<td>II.</td>
<td>Grants Received</td>
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<td>Non-Recurring (Plan)</td>
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<td>Recurring (Non-Plan)</td>
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<td>Diamond Jubilee Special Grant (Plan)</td>
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<td>III.</td>
<td>Income from Investment</td>
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<td>c) Own Funds</td>
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<td>a) On Bank Deposits</td>
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<td>VI.</td>
<td>Amount Borrowed/Loan refund received</td>
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<td>VII.</td>
<td>Other Receipts(Refund/Reimbursement)</td>
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## Payments for the Year Ended 31st March’2013

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<th>Sl.No</th>
<th>Payments</th>
<th>Current Year (2012-2013)</th>
<th>Previous Year (2011-2012)</th>
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<td>I.</td>
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<td>Expenditure on Fixed Assets &amp; Capital Work-in-Progress (Plan)</td>
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<td>IV.</td>
<td>Other Payments</td>
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<td>V.</td>
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<td>a) In Current Accounts</td>
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<td>b) In Savings Accounts</td>
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