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</tbody>
</table>

PART–I

Departments, Centres and Schools : 
Courses Offered : 

DEPARTMENTS

Aerospace Engineering : 
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 : 

CENTRES

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

SCHOOLS

G. S. Sanyal School of Telecommunications : 
Rajiv Gandhi School of Intellectual Property Law : 
School of Information Technology
School of Medical Science & Technology
Vinod Gupta School of Management

PART–II  CENTRALISED SERVICES, PROGRAMMES AND UNITS

Alumni Affairs & International Relations
Advanced Technology Development Centre
Computer and Informatics Centre
Continuing Education Centre
Central Research Facility
Central Library
Central Workshop & Instruments Service Section
Centre for Theoretical Studies
Information Cell
Institute Civil Works
Institute Electrical Works
Institute Water Works
Kalpana Chawla Space Technology Cell
National Cadet Corps (NCC)
National Service Scheme (NSS)
Rajbhasha Vibhag
Sponsored Research and Industrial Consultancy
Science & Technology Entrepreneurs’ Park
Training and Placement Section
Technology Telecom Centre
Technology Students Gymkhana

PART–III  STATISTICAL INFORMATION

Statistical Information of Students
Financial Information

RESEARCH PUBLICATIONS

PART–I

DEPARTMENTS

Aerospace Engineering
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

CENTRES

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

SCHOOLS

G. S. Sanyal School of Telecommunications
Rajiv Gandhi School of Intellectual Property Law
School of Information Technology
School of Medical Science & Technology
Vinod Gupta School of Management

PART–II CENTRALISED SERVICES, PROGRAMMES AND UNITS

Advanced Technology Development Centre
Central Library
Central Workshop and Instruments Service Section
Centre for Theoretical Studies
Kalpana Chawla Space Technology Cell
LIST OF THE MEMBERS OF IIT COUNCIL
(April 2007 – March 2008)

Name of the Representing Organization

(A) The Minister-in-Charge of Technical Education in the Central Government (Ex-officio)

1. Shri Arjun Singh Hon’ble Minister of Human Resource Development, New Delhi

(B) Chairman of each institute (Ex-officio)

(i) Kharagpur
2. Shri Sanjiv Goenka (Upto 20th March 2008)
   Shri B. Muthuraman (From 21st March 2008)
   Chairman, BOG, IIT Kharagpur
   Kharagpur – 721 302

(ii) Delhi
3. Dr. V. S. Ramamurthy
   Chairman, BOG, IIT Delhi
   Delhi – 110 016

(iii) Bombay
4. Dr. Anil Kakodkar
   Chairman, BOG, IIT Bombay
   Mumbai – 400 076

(iv) Madras
5. Prof. A. E. Muthunayagam
   Chairman, BOG, IIT Madras
   Chennai – 600 036

(v) Kanpur
6. Shri M. Anandakrishnan
   Chairman, BOG, IIT Kanpur
   Kanpur – 208 016

(vi) Guwahati
7. Shri Achyut Kumar Saikia
   Chairman, BOG, IIT Guwahati
   Guwahati – 781 039

(vii) Roorkee
8. Shri Jaiprakash Gaur
    Chairman, BOG, IIT Roorkee
    Roorkee – 247 667

(C) Director of each Institute (Ex-officio)

(i) Kharagpur
9. Prof. S. K. Dube

Member
(Upto 30th June 2007 Forenoon)
Prof. Damodar Acharya
(From 30th June 2007 Afternoon)
Director, IIT Kharagpur
Kharagpur – 721 302

(ii) Delhi
10. Prof. Surendra Prasad
   Director, IIT Delhi
   New Delhi – 110 016

(iii) Bombay
11. Prof. Ashok Misra
    Director, IIT Bombay
    Mumbai – 400 076

(iv) Madras
12. Prof. M. S. Ananth
    Director, IIT Madras
    Chennai – 600 036

(v) Kanpur
13. Prof. S. G. Dhande
    Director, IIT Kanpur
    Kanpur – 208 016

(vi) Guwahati
14. Prof. Gautam Baura
    Director, IIT Guwahati
    Guwahati – 781 039

(vii) Roorkee
15. Prof. S. C. Saxena
    Director, IIT Roorkee
    Roorkee – 247 667

(D) Chairman, University Grants Commission
   (Ex-officio)
16. Prof. Sukhdeo Throat
    Chairman
    University Grants Commission
    Bahadurshah Zafar Marg
    New Delhi – 110 002

(E) Director-General, Council of Scientific & Industrial Research
    (Ex-officio)
17. Dr. R. A. Mashelkar
    Director General
    Council of Scientific & Industrial Research
    Anusandhan Bhawan, Rafi Marg
    New Delhi –110 001

(F) Chairman, Council of the Indian Institute of Science, Bangalore
    (Ex-officio)
18. Dr. K. Kasturirangan
    Chairman
    Indian Institute of Science
    Bangalore – 560 012

(G) Director, Indian Institute of Science,
19. Prof. P. Balaram
    Director
    Member
Three Nominees of the Central Government

(i) To represent Ministry concerned with Technical Education

20. Shri R. P. Agrawal
Secretary, Department of Secondary & Higher Education
Government of India
Ministry of Human Resource Development
Shastri Bhavan
New Delhi – 110 001

(ii) To represent Ministry of Finance

21. Shri D. Swarup
Secretary, Department of Expenditure
Government of India
Ministry of Finance
North Block
New Delhi – 110 001

(iii) To represent any other Ministry

22. Shri Brijesh Kumar
Secretary, Department of Information Technology
Government of India
Ministry of Communication and Information Technology
Electronics Niketan
6, C.G.O. Complex
New Delhi – 110 003

Nominee of the All India Council for Technical Education (AICTE)

23. Prof. Damodar Acharya
Chairman, AICTE
I.P. Estate
I.G. Sports Complex
New Delhi – 110 001

Nominees of the Visitor (Not less than three) (Not more than five persons)

24. Prof. C. N. R. Rao
Eminent Scientist and presently
Chairman, Scientific Advisory Council to the Prime Minister

25. Prof. C. S. Seshadri
Director
Chennai Mathematical Institute, Chennai
Plot H1, SIPCOT IT Park
Padur PO
Siruseri – 603 103
<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Position</th>
<th>Address</th>
</tr>
</thead>
</table>
| 26. | Prof. Sabyasachi Bhattacharya              | Member                                        | Director  
Tata Institute of Fundamental Research  
Homi Bhabha Road  
Mumbai – 400 005                                                    |
| 27. | Dr. Kota Harinarayan                      | Member                                        | Chairman  
Research Council of Central Scientific Instrument Organization  
Raja Ramana Fellow  
National Aerospace Laboratory  
P.O. No. 1779  
Bangalore – 560 017                                               |
| 28. | Shri Tarun Das                            | Member                                        | Chief Mentor  
Confederation of Indian Industry  
Plot No. 249-F, Sector 18  
Udyog Vihar, Phase IV  
Gurgaon – 122 015 (Haryana)                                      |
| (K) | Three members of Parliament (Two from Lok Sabha and one from Rajya Sabha) | Member                                        |                                          |
| 29. | Shri Milind Deora                         | Member                                        | Member of Parliament (Lok Sabha)  
65, Lodhi Estate  
New Delhi – 110 003                                                |
| 30. | Shri Ananta Nayak                         | Member                                        | Member of Parliament (Lok Sabha)  
180, South Avenue  
New Delhi – 110 001                                                |
| 31. | Shri B. J. Panda                           | Member                                        | Member of Parliament (Rajya Sabha)  
2, Mahadev Road  
New Delhi – 110 001                                                |
| (L) | Secretary to the Council                  | Member                                        |                                          |
| 32. | Shri Ravi Mathur                          | Member                                        | Joint Secretary (T)  
Department of Secondary & Higher Education  
Government of India  
Ministry of Human Resource Development  
Shastri Bhavan  
New Delhi – 110 001                                                |
# BOARD OF GOVERNORS

<table>
<thead>
<tr>
<th>#</th>
<th>Name and Address</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Shri Sanjiv Goenka (upto 20.03.2008) Chairman, BOG, IIT Kharagpur &amp; Vice-Chairman, RPG Enterprises CESC House, Chowringhee Square Kolkata – 700 001</td>
<td>Chairman</td>
</tr>
<tr>
<td>2.</td>
<td>Shri B. Muthuraman (from 21.03.2008) Chairman, BoG, IIT Kharagpur &amp; Managing Director Tata Steel Limited Jamshedpur – 831 001</td>
<td>Chairman</td>
</tr>
<tr>
<td>3.</td>
<td>Shri Roopen Roy Managing Director Deloitte &amp; Touche Consulting India Pvt. Ltd. Bengal Intelligent Park, Building Alpha, 1(^{st}) Floor Plot No.A2, M2 &amp; N2, Block–EP &amp; GP Sector-V, Salt Lake Electronics Complex Kolkata – 700 091</td>
<td>Member</td>
</tr>
<tr>
<td>4.</td>
<td>Dr. Dhruv Prasad Director, Department of Science &amp; Technology Government of Bihar Patna – 800 015</td>
<td>Member</td>
</tr>
<tr>
<td>5.</td>
<td>Prof. O. N. Mohanty Vice-Chancellor Bijupatnaik University of Technology, Rourkela Camp Techno Campus C.E.T. Ghatikia, Kalinganagar Bhubaneswar – 751 003</td>
<td>Member</td>
</tr>
<tr>
<td>6.</td>
<td>Shri B. Muthuraman (upto 20.03.2008) Managing Director, Tata Steel The Tata Iron &amp; Steel Co. Ltd. (TISCO) Jamshedpur – 831 001</td>
<td>Member</td>
</tr>
<tr>
<td>7.</td>
<td>Shri R. P. Agrawal Secretary, Government of India Ministry of Human Resource Development Department of Higher Education Shastri Bhawan New Delhi – 110 001</td>
<td>Member</td>
</tr>
<tr>
<td>8.</td>
<td>Prof. T. P. Singh Head of the Department (Bio-Physics)</td>
<td>Member</td>
</tr>
</tbody>
</table>
9. Dr. Kiran Karnik (upto 19.01.2008)  
President  
National Association of Software and service Companies  
(NASSCOM), International Youth Centre,  
Teen Murti Marg, Chanakyapuri  
New Delhi – 110 021

10. Prof. D. Acharya  
Director  
IIT Kharagpur

Department of Metallurgical & Materials Engineering  
IIT Kharagpur

Department of Humanities & Social Sciences  
IIT Kharagpur

13. Prof. P. P. Chakrabarti (from 01.01.2008)  
Department of Computer Science & Engineering  
IIT Kharagpur

14. Prof. Sanat Kumar Roy (from 01.01.2008)  
Department of Metallurgical & Materials Engineering  
IIT Kharagpur

15. Dr. D. Gunasekaran  
Registrar  
IIT Kharagpur
## FINANCE COMMITTEE

<table>
<thead>
<tr>
<th>#</th>
<th>Name and Address</th>
<th>Position</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Shri Sanjiv Goenka (upto 20.03.2008) Chairman, BOG, IIT Kharagpur &amp; Vice-Chairman, RPG Enterprises CESC House, Chowringhee Square Kolkata – 700 001</td>
<td>Chairman</td>
</tr>
<tr>
<td>2.</td>
<td>Shri B. Muthuraman (from 21.03.2008) Chairman, BoG, IIT Kharagpur &amp; Managing Director Tata Steel Limited Jamshedpur – 831 001</td>
<td>Chairman</td>
</tr>
<tr>
<td>3.</td>
<td>Shri Roopen Roy Managing Director Deloitte &amp; Touche Consulting India Pvt. Ltd. Bengal Intelligent Park, Building Alpha, 1st Floor Plot No.A2, M2 &amp; N2, Block–EP &amp; GP Sector-V, Salt Lake Electronics Complex Kolkata – 700 091</td>
<td>Member</td>
</tr>
<tr>
<td>5.</td>
<td>Joint Secretary (T) Government of India Ministry of Human Resource Development Department of Higher Education Shastri Bhawan New Delhi – 110 001</td>
<td>Member</td>
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<tr>
<td>6.</td>
<td>Prof. D. Acharya Director IIT Kharagpur</td>
<td>Member</td>
</tr>
<tr>
<td>8.</td>
<td>Prof. P. P. Chakrabarti (from 01.01.2008) Department of Computer Science &amp; Engineering IIT Kharagpur</td>
<td>Member</td>
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<tr>
<td>9.</td>
<td>Dr. D. Gunasekaran Registrar IIT Kharagpur</td>
<td>Secretary</td>
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<tr>
<td>#</td>
<td>Name and Address</td>
<td>Position</td>
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</tbody>
</table>
| 1. | Prof. D. Acharya  
IIT Kharagpur                                             | Chairman   |
| 2. | Director (T)  
Government of India  
Ministry of Human Resource Development  
Department of Higher Education  
Shastri Bhawan  
New Delhi – 110 001 | Chairman   |
| 3. | Shri D. K. Mitra  
Superintending Engineer & Circle Manager  
Midnapore Distribution Circle  
West Bengal State Electricity  
Distribution Co. Ltd. (WBSEDCL)  
190, S. K. Bose Road  
PIN – 721 101  
Paschim Medinipur | Member     |
| 4. | Shri Shankar Kumar Chakraborty  
Superintending Engineer  
South Western Circle  
Public Works Department (PWD)  
Saheed Mangal Pandey Sarani  
PIN – 721 101  
Paschim Medinipur | Member     |
| 5. | Head  
Department of Civil Engineering  
IIT Kharagpur                             | Member     |
| 6. | Head  
Department of Electrical Engineering  
IIT Kharagpur                             | Member     |
| 7. | Head  
Department of Architecture & Regional Planning  
IIT Kharagpur                             | Member     |
| 8. | Dr. D. Gunasekaran  
Registrar  
IIT Kharagpur                             | Member     |
<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Upto</th>
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<tbody>
<tr>
<td>Director</td>
<td>Prof. S. K. Dube</td>
<td>30.06.2007</td>
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<td></td>
<td>Prof. Damodar Acharya</td>
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<td>30.06.2007</td>
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<tr>
<td>Deputy Director</td>
<td>Prof. M. Chakraborty</td>
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<tr>
<td><strong>Deans</strong></td>
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<tr>
<td>Undergraduate Studies</td>
<td>Prof. B. S. Sastry</td>
<td>30.09.2007</td>
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<td></td>
<td>Prof. S. K. Som</td>
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<td>01.10.2007</td>
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<tr>
<td>Faculty &amp; Planning</td>
<td>Prof. R. N. Datta</td>
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<tr>
<td>Postgraduate Studies &amp; Research</td>
<td>Prof. S. K. Satsangi</td>
<td>30.09.2007</td>
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<td></td>
<td>Prof. P. K. J. Mohapatra</td>
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<td>01.10.2007</td>
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<tr>
<td>Sponsored Research &amp; Industrial Consultancy</td>
<td>Prof. P. P. Chakrabarti</td>
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<tr>
<td>Students’ Affair</td>
<td>Prof. H. R. Tewari</td>
<td>30.09.2007</td>
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<td>Prof. D. K. Tripathy</td>
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<td>01.10.2007</td>
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<tr>
<td>Continuing Education</td>
<td>Prof. Bani Chatterjee</td>
<td>30.09.2007</td>
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<td></td>
<td>Prof. Ajoy Chakraborty</td>
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<td>01.10.2007</td>
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<tr>
<td>Alumni Affairs &amp; International Relations</td>
<td>Prof. Ajay Chakraborty</td>
<td>30.09.2007</td>
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<td>Prof. Amit Patra</td>
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<tr>
<td>Vinod Gupta School of Management</td>
<td>Prof. Probir Kumar Gupta</td>
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<tr>
<td><strong>Head of Departments</strong></td>
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<tr>
<td>Aerospace Engineering</td>
<td>Prof. P. K. Datta</td>
<td>30.09.2007</td>
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<td>Prof. Navtej Singh</td>
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<td>01.10.2007</td>
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<tr>
<td>Agricultural &amp; Food Engineering</td>
<td>Prof. B. C. Mal</td>
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<tr>
<td>Architecture &amp; Regional Planning</td>
<td>Prof. U. K. Banerjee</td>
<td>30.09.2007</td>
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<td>Prof. Arif N. Merchant</td>
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<td>01.10.2007</td>
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<tr>
<td>Biotechnology</td>
<td>Prof. A. K. Ghosh</td>
<td></td>
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<tr>
<td>Chemical Engineering</td>
<td>Prof. Dibyendu Mukherjee</td>
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<tr>
<td>Chemistry</td>
<td>Prof. Amit Basak</td>
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<tr>
<td>Civil Engineering</td>
<td>Prof. S. P. Dasgupta</td>
<td></td>
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<tr>
<td>Computer Science &amp; Engineering</td>
<td>Prof. Anupam Basu</td>
<td>09.04.2007</td>
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<td>Prof. Indranil Sengupta</td>
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<td>10.04.2007</td>
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<td>Electrical Engineering</td>
<td>Prof. S. K. Das</td>
<td>30.09.2007</td>
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<td>Prof. A. K. Sinha</td>
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<td>11.10.2007</td>
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<tr>
<td>Electronics &amp; Electrical</td>
<td>Prof. Debasish Datta</td>
<td></td>
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<td>Communication Engineering</td>
<td>Prof. A. K. Gupta</td>
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<td>Geology &amp; Geophysics</td>
<td>Prof. Bani Chatterjee</td>
<td>30.09.2007</td>
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<td>Prof. D. Suar</td>
<td></td>
<td>11.10.2007</td>
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<td>Humanities &amp; Social Sciences</td>
<td>Prof. P. K. Ray</td>
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<td>Industrial Engineering &amp; Management</td>
<td>Prof. S. S. Alam</td>
<td>30.09.2007</td>
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<td></td>
<td>Prof. A. R. Roy</td>
<td></td>
<td>01.10.2007</td>
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</table>
Mechanical Engineering
Prof. S. K. Som
Prof. A. K. Chattopadhyay
Upto 30.09.2007
From 01.10.2007

Metallurgical & Materials Engineering
Prof. N. Chakraborti

Mining Engineering
Prof. K. U. M. Rao
Prof. J. Bhattacharyya
Upto 30.09.2007
From 01.10.2007

Ocean Engineering & Naval Architecture
Prof. D. Sen
Prof. N. R. Mandal
Upto 30.09.2007
From 01.10.2007

Physics & Meteorology
Prof. B. K. Mathur

Head of Centres

Centre for Oceans, Rivers, Atmosphere and Land Sciences
Prof. S. K. Satsangi

Computer & Informatics
Prof. Rajib Mall
Prof. Prabir Kumar Biswas
Upto 09.03.2008
From 10.03.2008

Cryogenic Engineering
Prof. V. V. Rao

Material Science
Prof. C. K. Das

Reliability Engineering
Prof. R. B. Misra

Rubber Technology
Prof. A. K. Bhowmick
Prof. T. K. Chaki
Upto 30.09.2007
From 01.10.2007

Rural Development
Prof. H. R. Tewari
Prof. P. B. S. Bhadoria
Upto 30.09.2007
From 01.10.2007

Administrative Computer Service Support Centre
Prof. Rajib Mall

Head of Schools

G. S. Sanyal School of Telecommunication
Prof. S. Chakrabarti

School of Information Technology
Prof. I. Sengupta

School of Medical Science & Technology
Prof. A. K. Ray

Vinod Gupta School of Management
Prof. Probir Kumar Gupta

Rajiv Gandhi School of Intellectual Property Law
Prof. S. Tripathy

Chairmen & Vice-Chairmen

UG Admissions
Prof. A. K. Ghosh

Vice-Chairman, UG Admissions
Prof. A. N. Samanta

PG Admissions
Prof. Souvik Bhattacharyya
Prof. O. P. Sha
Upto 30.06.2007
From 01.07.2007

Vice-Chairman, PG Admissions
Prof. O. P. Sha
Upto 30.06.2007
Professors-in-Charge

Examinations
Prof. S. K. Bhattacharyya
From 01.07.2007
Prof. S. K. Bhattacharyya
Upto 30.09.2007
Prof. P. D. Srivastava
From 01.10.2007
Training & Placement
Prof. Gautam Sinha
From 01.07.2007
Prof. B. K. Mathur
From 01.10.2007
Prof. B. K. Mathur
Upto 30.09.2007
General Time Table
Prof. B. Mahanty
Convocation
Prof. S. K. Satsangi
For 2007
Institute Information Cell
Prof. B. K. Mathur
President, Technology
Prof. N. S. Raghuvanshi
From 01.07.2007
Prof. N. S. Raghuvanshi
Upto 30.09.2007
Students Gymkhana
Prof. Manish Bhattacharjee
From 01.07.2007
Prof. Manish Bhattacharjee
Upto 30.09.2007
Refrigeration & Air Conditioning
Prof. Sukanta Dash
From 01.07.2007
Prof. Sukanta Dash
Upto 30.09.2007
Horticulture
Prof. S. C. Kundu
Water Works
Prof. S. N. Panda
From 01.07.2007
Prof. S. N. Panda
Upto 30.09.2007
Prof. A. K. Gupta
From 01.10.2007
Prof. A. K. Gupta
Upto 30.09.2007
Civil Works (Construction and Maintenance)
Prof. J. Barman
From 01.07.2007
Prof. J. Barman
Upto 30.09.2007
Prof. S. K. Bhattacharya
From 01.10.2007
Prof. S. K. Bhattacharya
Upto 30.09.2007
Electrical Works
Prof. N. K. Kishore
From 01.07.2007
Prof. N. K. Kishore
Upto 30.09.2007
Prof. S. Sengupta
From 01.10.2007
Prof. S. Sengupta
Upto 30.09.2007
Telecommunication
Prof. S. S. Pathak
From 01.07.2007
Prof. S. S. Pathak
Upto 30.09.2007
Prof. R. V. Raja Kumar
From 01.10.2007
Institute Guest Houses
Prof. B. K. Sengupta
Intellectual Property Right & Industrial Relation
Prof. S. Tripathy
### General

<table>
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<tr>
<th>Position</th>
<th>Name</th>
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<tr>
<td>Registrar</td>
<td>Dr. D. Gunasekaran</td>
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<td>Public Information Officer</td>
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<tr>
<td>Head, B.C. Roy Technology Hospital</td>
<td>Dr. (Mrs.) Seema Roy</td>
<td>Upto 19.12.2007</td>
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<tr>
<td>Superintending Engineer (Civil)</td>
<td>Dr. Nirmal Kanti Som</td>
<td>From 20.12.2007</td>
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<tr>
<td>Executive Engineer (Civil)</td>
<td>Shri T. K. Mukherjee</td>
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<td>Executive Engineer (Electrical)</td>
<td>Shri Subrat Roy</td>
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<td>Executive Engineer (Horticulture)</td>
<td>Shri Sabyasachi Ghosh</td>
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<td>Shri A. K. Gangopadhyay</td>
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### Deputy Registrars

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<th>Section</th>
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<tr>
<td>Establishment Section</td>
<td>Dr. Tapan Kumar Ghosal</td>
<td>Upto 02.10.2007</td>
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<td>Shri Atul Prakash Trivedi</td>
<td>From 03.10.2007</td>
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<td>Academic Section</td>
<td>Shri Nalini Ranjan Maiti</td>
<td>Officiating since 21.02.2008</td>
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<td>Finance &amp; Accounts Section</td>
<td>Shri Atul Prakash Trivedi</td>
<td>Upto 02.10.2007</td>
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<td>Dr. Tapan Kumar Ghosal</td>
<td>From 03.10.2007</td>
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<tr>
<td>Rajiv Gandhi School of Intellectual Property Law</td>
<td>Shri B. K. Basu Roychowdhury</td>
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THE SENATE

**Director (Chairman)**
Prof. Shishir Kumar Dube (Upto 30.06.2007)
Prof. Damodar Acharya (From 30.06.2007)

**Deputy Director**
Prof. Madhusudan Chakraborty

**Department of Aerospace Engineering**
Prof. Amit Kumar Ghosh
Prof. Prosun Kumar Datta
Prof. Gautam Bandyopadhyay
Prof. Navtej Singh

**Department of Agricultural & Food Engineering**
Prof. Keshaw Prasad Pandey
Prof. Bimal Chandra Mal
Prof. Rajendra Singh
Prof. Virendra Kumar Tewari
Prof. Kamlesh Narayan Tiwari
Prof. Rabindra Kumar Panda
Prof. Rintu Banerjee
Prof. Susanta Kumar Das
Prof. Bijoy Chandra Ghosh
Prof. Pratapbhanu Singh Bhadoria
Prof. Ashis Kumar Dutta
Prof. Hari Niwas Mishra
Prof. Narendra Singh Raghuwanshi
Prof. Sudhindra Nath Panda
Prof. Tridib Kumar Goswami

**Department of Architecture & Regional Planning**
Prof. Rabindranath Datta
Prof. Biplab Kumar Sengupta
Prof. Uttam Kumar Banerjee
Prof. Arif Noman Merchant

**Department of Biotechnology**
Prof. Subhas Chandra Kundu
Prof. Debabrata Das
Prof. Satyahari Dey
Prof. Ananta Kumar Ghosh
Prof. Amit Kumar Das

**Department of Chemical Engineering**
Prof. Dibyendu Mukherjee
Prof. Amar Nath Samanta
Prof. Sunando Dasgupta
Prof. Narayan Chandra Pradhan
Prof. Sirshendu De

Department of Chemistry

Prof. Panchanan Pramanik
Prof. Tarun Kumar Sarkar
Prof. Jayanta Kumar Ray
Prof. Pratim Kumar Chatteraj
Prof. Sujit Roy
Prof. Tanmaya Pathak
Prof. Tarasankar Pal
Prof. Amit Basak
Prof. Dipakranjan Mal
Prof. Debasish Ray
Prof. Manish Bhattacharjee
Prof. Suneel Kumar Srivastava

Department of Civil Engineering

Prof. Janendra Nath Bandyopadhyay
Prof. Deba Prasad Ghosh
Prof. Shambhu Pada Dasgupta
Prof. Sriman Kumar Bhattacharyya
Prof. Kusam Sudhakar Reddy
Prof. Lingadahally S. Ramachandra
Prof. Subhasish Dey

Department of Computer Science & Engineering

Prof. Ajit Pal
Prof. Arun Kumar Majumdar
Prof. Sujoy Ghose
Prof. Partha Pratim Chakraborty
Prof. Anupam Basu
Prof. Indranil Sengupta
Prof. Jayanta Mukhopadhyay
Prof. Sudebkumar Prasant Pal
Prof. Rajib Mall
Prof. Dipankar Sarkar
Prof. Dipanwita Roy Chowdhury
Prof. Pallab Dasgupta
Prof. Rajeev Kumar
Prof. Sudeshna Sarkar

Cryogenic Engineering Centre
Prof. Sunil Kumar Sarangi
Prof. Syamalendu Sekhar Bandyopadhyay
Prof. Vishwanath Rao. Kalvey (Retired on 31.08.2007)
Prof. Tapas Kumar Dey
Prof. Vutukuru Vasudeva Rao
Prof. Kanchan Chowdhury

Department of Electrical Engineering

Prof. Tapan Kumar Basu
Prof. Sarit Kumar Das
Prof. Avinash Kumar Sinha
Prof. Jayanta Pal
Prof. Soumitra Banerjee
Prof. Amit Patra
Prof. N. K. Kishore
Prof. Alok Barua
Prof. Goshaidas Ray
Prof. Siddhartha Mukhopadhyay
Prof. Siddhartha Sen
Prof. Pranab Kumar Dutta
Prof. Murali Mohan Bosukonda
Prof. Debapriya Das
Prof. Sabyasachi Sengupta
Prof. Tapas Kumar Bhattacharya

Department of Electronics & Electrical Communication Engineering

Prof. Ramesh Garg
Prof. Ajoy Chakraborty
Prof. Debasish Dutta
Prof. Ajoy Kumar Roy
Prof. Swapna Banerjee
Prof. Chinmay Kumar Maiti
Prof. Ratnam Varada Raja Kumar
Prof. Prabir Kumar Biswas
Prof. Somnath Sengupta
Prof. Mrityunjoy Chakraborty
Prof. Sant Sharan Pathak
Prof. Subrata Sanyal
Prof. Dhrubes Biswas

Department of Geology & Geophysics
Prof. Sankar Kumar Nath
Prof. Biswajit Mishra
Prof. Anil Kumar Gupta
Prof. Debashish Sengupta
Prof. Abhijit Bhattacharya
Prof. Subhasish Tripathy
Prof. Anindya Sarkar
Prof. Subhasish Das

G. S. Sanyal School of Telecommunications

Prof. Saswat Chakraborti

Department of Humanities & Social Sciences

Prof. Bani Chatterjee
Prof. Partha Basu
Prof. Hare Ram Tewari
Prof. Manas Kumar Mandal
Prof. Damodar Suar
Prof. Anjali Gera Ray
Prof. Kailash Bihari Lal Srivastava
Prof. Suhita Chopra Chatterjee

Department of Industrial Engineering & Management

Prof. Pratap Kumar Jagadev Mohapatra
Prof. Rabindra Nath Banerjee
Prof. Sadananda Sahu
Prof. S. Srinivasan
Prof. Biswajit Mahanty
Prof. Pradip Kumar Ray

Materials Science Centre

Prof. Ajit Kumar Banthia
Prof. Debasis Bhattacharya
Prof. Chapal Kumar Das
Prof. Basudam Adhikari
Prof. Shanker Ram

Department of Mathematics
Prof. Sudarsan Nanda
Prof. Syed Samsul Alam
Prof. Akhil Ranjan Roy
Prof. Parmeshwary Dayal Srivastava
Prof. Anjan Sarkar
Prof. Umesh Chandra Gupta
Prof. Mahendra Prasad Biswal
Prof. Dharmendra Kumar Gupta
Prof. Vinay Kumar Jain
Prof. Somnath Bhattacharyya
Prof. Adrijit Goswami
Prof. Somesh Kumar

Department of Mechanical Engineering

Prof. Amalendu Mukherjee
Prof. Brajabandhu Pradhan
Prof. Prasanta Kumar Mishra (Voluntarily retired on 31.07.2007)
Prof. Sankar Kumar Som
Prof. Venkata Varanasi Satyamurthy
Prof. Ranjit Karmakar
Prof. Samar Kumar Roy Chowdhury
Prof. Ranajit Kumar Brahma
Prof. Ajay Kumar Chattopadhyay
Prof. Souvik Bhattacharya
Prof. Ranjan Bhattacharyya
Prof. Sukanta Kumar Dash
Prof. Prasanta Kumar Das
Prof. Amiya Ranjan Mohanty
Prof. Sati Nath Bhattacharyya
Prof. Rathindranath Maiti
Prof. Biswajit Maiti
Prof. Soumitra Paul

Department of Metallurgical & Materials Engineering

Prof. Brij Kumar Dhindaw
Prof. Shyamal Kumar Pabi
Prof. Sanat Kumar Roy
Prof. Mahadev Malhar Godkhindi
Prof. Kalyan Kumar Ray
Prof. Sarat Chandra Panigrahi
Prof. Nirupam Chakraborty
Prof. Indranil Manna
Prof. Siddhartha Das

Department of Mining Engineering
Prof. S. Suryanarayana Bhamidipati
Prof. Ashis Bhattacharya
Prof. Karanam Uma Maheshwar Rao
Prof. Samir Kumar Das
Prof. Khanindra Pathak
Prof. Jayanta Bhattacharyya
Prof. Subir Kumar Mukhopadhyay

**Department of Ocean Engineering & Naval Architecture**

Prof. Suresh Chandra Misra
Prof. Subir Kumar Satsangi
Prof. Nisith Ranjan Mandal
Prof. Debabrata Sen
Prof. Om Prakash Sha

**Department of Physics & Meteorology**

Prof. Sobhendu Kumar Ghatak
Prof. Ram Naresh Prasad Choudhary
Prof. Naresh Chandra
Prof. Balbir Kumar Mathur
Prof. Biswas Kumar Samantaray
Prof. Shivcharan Lal Sharma
Prof. Anantharaman Chandrasekar
Prof. Srinivas Veeturi
Prof. Samit Kumar Ray
Prof. Arghya Taraphder
Prof. Krishna Kumar
Prof. Prabhu Krishna Raina

**Reliability Engineering Centre**

Prof. Ravindra Babu Mishra

**Rubber Technology Centre**

Prof. Anil Kumar Bhowmick
Prof. Deba Kumar Tripathy
Prof. Golok Behari Nando
Prof. Dipak Khastgir
Prof. Tapan Kumar Chaki

**Vinod Gupta School of Management**

Prof. Gautam Sinha
Prof. Kalyan Kumar Guin

**Nominated Members**
Dr. Bablu Sutradhar, Librarian
Prof. Probir Kumar Gupta, Dean, VGSOM

Registrar (Secretary)

Dr. D. Gunasekaran

Students Representative

Sri Kunal Kashyap (Roll No. : 04MI1003)
Sri Rajeev Pandey (Roll No. : 04EE1007)
Sri Sourabh Jaiswal (Roll No. : 06ME6222)
Ms. Aditi Oza (Roll No. : 06CR9402)
DIRECTOR’S REPORT

IIT Kharagpur continued taking new strides towards evolving directions to further the growth and dissemination of scientific and technological knowledge during the year 2007-2008. Brief outlines of the major activities of the Institute during the year 2007-2008 are highlighted.

ACADEMIC PROGRAMS

The Institute has been very sensitive to the human resource development of the country and to that end continued initiating new academic programs.

During the year 2007-2008, two new M.Tech. programmes were introduced, one in Infrastructure Design and Management and the other in Water Management. To provide more specialization options for the undergraduate students, the Institute is permitting the B.Tech. students to join Dual Degree Programme in the same Department at the end of the sixth semester, subject to the Department's recommendation. All the Dual Degree programmes include the major B.Tech. degree along with the chosen M.Tech. specialization. Two new five-year dual degree programmes are under active consideration of the Institute, one with B.Tech. in any branch of engineering and M.Tech. in Financial Engineering and the other with B.Tech. in any branch of engineering and M.Tech. in Engineering Entrepreneurship.

The Institute has prepared a perspective plan for increasing the number of student intake. Accordingly, all facilities and infrastructure are being upgraded. For the academic year 2008-2009, the Institute has increased its student intake by 13 percent in respect of the intake of students in the academic year 2007-2008, which has been taken as the base year. The Institute will further increase the student intake by 30 percent in the academic year 2009-2010 and by 54 percent in the academic year 2010-2011 in respect of the base year. The number of Ph.D. scholars with assistantship has also been increased.

The Institute is presently offering B.Tech (Hons) courses in sixteen different branches of engineering, a B.Arch (Hons) course in Architecture, Dual Degree programs, seven Integrated M.Sc. programs, six two-year M.Sc. programs, fifty postgraduate degree courses leading to M.Tech/MCP/MBM/MMST degrees besides an LL.B. degree program with specialisation in IPR and one postgraduate diploma course. The contents of these courses are constantly revised to meet the needs of the changing world with focus on quality and excellence.

CONVOCATION

Fifty-third Convocation of the Institute was held on 15th September 2007. Prof. George F. Smoot, Novel Laureate, Professor of Physics at University of California Berkeley, was the Chief Guest. In the Convocation, 163 Ph.D., 35 MS, 524 M.Tech. 22 MCP, 117 MBA, 171 Dual Degree, 08 MMST, 70 PGDIT, 05 PGDMOM, 10 PGDTNM, 34 PGDBA, 21 PGDST, 15 PGDM, 174 M.Sc 375 B.Tech (Hons) and 13 B.Arch (Hons) degrees were conferred. Shri Arka Majumdar of the Department of Electronics & Electrical Communication Engineering was the recipient of President of India Gold Medal for the best academic performance among
the outgoing B. Tech.(Hons.) and B.Arch.(Hons.) students. Shri Shreepriya Das of the Department of Electronics and Electrical Communication 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 Kaushik Sengupta of the Department of Electronics and Electrical Communication 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 Anindya Dutta of the Department of Biotechnology & Biochemical Engineering. Shri Amit Singha Roy of the Department of Physics and Meteorology 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. Shri Debesh Bhatta of the Department of Electronics & Electrical Communication Engineering was the recipient of The Director's Gold Medal for the best academic performance among the students completing M.Tech. and MCP courses.

In the 53rd Convocation, the Senate and the Board of Governors of the Institute conferred the highest honour, Doctor of Science (Honoris Causa), on Dr. Praveen Chaudhari, Dr. D. Rajagopal Reddy and Shri N. R. Narayana Murthy. Dr. Praveen Chaudhari is awarded for the discovery and development of a new class of amorphous magnetic materials which is today the foundation of magnetic-optic disk industry, Dr. Raj Reddy is awarded for his significant contribution in the fields of human-computer interaction and artificial intelligence, and Sri N. R. Narayana Murthy is awarded for his entrepreneurial skills that have lasting influence in creating new consulting and IT services.

In the Convocation, to recognize the significant contributions of eminent individuals, alumni and well-wishers, the Senate and the Board of Governors of the Institute conferred Distinguished Alumnus Awards. The awards were conferred on Professor Kirit S. Parikh, Emeritus Professor and former Director of Indira Gandhi Institute of Development Research and Member (Energy) Planning Commission, Government of India; Professor Panjab Singh Vice Chancellor, Banaras Hindu University and Former Director ICAR; Professor Surendra Prasad, Director of Indian Institute of Technology Delhi; Dr. Prithviraj Banerjee, Senior Vice President of Research and Director, HP Labs of Hewlett Packard Company; and Professor Supriyo Datta, Director, NASA Institute for Nanoelectronics and Computing and Professor at Purdue University.

RESEARCH AND DEVELOPMENT ACTIVITIES

The Institute, besides producing world-class graduates, has also proven to be a knowledge powerhouse of global reckoning and gained the confidence of industrial houses, both domestic and international. The academic Departments, Centres and a large number of R&D laboratories of the Institute continue to carry out research and development in a number of unique areas. Technology leaders from across the globe are looking forward to the Institute for solution to their problems.

Focused research groups in various specialized knowledge domains are fast coming up in the form of Centers of Excellence. Some of the major research initiatives in recent years include Steel Technology Center, R&D Center in Energy Sector in collaboration with DVC, Tea Engineering Research Center, Vodafone-Essar-IIT Kharagpur Centre of Excellence In
Telecommunications, National Program in Marine Hydrodynamics, Santech-IIT Kharagpur Research Initiative in Telecommunication, Centre of Excellence in Information Assurance, General Motors Collaborative Research Laboratory in Electronics Controls and Software (ECS), a Regional Center for Rural Technology Action Group (RUTAG) and Food Science and Technology Programme funded by the Department of Biotechnology, Government of India. The Institute is also working towards development of major research and development units in nanotechnology.

IIT Kharagpur has special expertise in advanced chip design and CAD for VLSI and MEMS including in niche areas like formal verification where it works hand in hand with a large number of international organizations. The MEMS group has made significant contributions to national research programmes of ISRO and DRDO by development of advanced accelerometers, gyros, micro-valves, etc. The area of micro-bio-fluidics and bio-nano-mems has developed new techniques for DNA hybridization.

Life sciences research forms a major thrust area. Green technology routes have produced unique protocols for insect resistant cotton, jute, bio-hydrogen, etc. Biotechnology research has resulted in a number of high-quality enzymatic processes for a variety of food technologies several of which have been transferred. The institute has initiated research in medical science and technology. Most prominent among them is RISUG that is undergoing third phase of trials. Interdisciplinary research is being carried out in areas of noninvasive measurements, advanced image processing, medical implants, orthopedic biomechanics and brain research.

Research in nano-materials, smart composites, polymers (especially rubber technology) and metallurgy include unique microstructures prepared from gelcast ceramics, nano-composites, nano-wires, semiconductors and metal alloys. Some of the areas of significant contributions in mechanical sciences include CFD, motion and vibration dynamics, robotics and robot development and thermal engineering. A new thrust has been provided to energy research including fuel cell based systems and energy materials. The institute has developed state-of-the-art cutting tools comparable to the best available worldwide. Prototype vehicle development has been an area of thrust. These include development of a large autonomous underwater vehicle, fault-tolerant micro-aero vehicle, hovercraft and electric vehicles. The institute has special expertise in advanced plasma technologies and plasma based materials that are being used for advanced research for industrial, strategic and biomedical areas. Research activities are also going on in the areas of Photonics involving fiber and integrated optics, application of micropaleontology in exploration gas hydrates, geophysical tomography and natural hazards, total quality management, risk analysis and safety management in the Indian mining industries.

In the areas of Infrastructure design and spatial planning, the Institute is making significant contributions to low-cost road construction, urban development, estimation and prediction of scour at bridge piers and abutments.

The large gamuts of specialized software developed in the Institute are being widely used in several areas like power systems, system simulation, biomechanics, fluid mechanics and ocean dynamics both within and outside the country.

**INFRASTRUCTURE DEVELOPMENT**
In order to cope with the rapid advances in science and technology, the infrastructure and experimental facilities are constantly modernized. During the year 2007-2008, several new scientific equipment have been acquired and installed, and new facilities created in the Departments, Centers and Schools. A 50-meter micro-meteorological tower with various atmospheric measurement sensors is established, as a national facility, in the Institute to make special observations during pre-monsoon thunderstorms. In the School of Information Technology, a special research and development laboratory has been set up with the support from Microsoft Corporation, USA. An Electron Probe Micro-Analyzer (EPMA) National facility, funded by the Department of Science & Technology, is being set up in the Department of Geology & Geophysics. The Materials Science Centre has acquired scanning electron microscope. These facilities will further our research capabilities in the fields of earth sciences, material and metallurgical sciences and in physical sciences. The Electrical Engineering Department has created a real-time embedded system laboratory for training and research. A new protein crystallography laboratory has been developed in the Central Research Facility.

The IIT Kharagpur’s continuously growing campus needs constant revamping and augmentation of facilities. To this end, several actions have been taken. The major ones in this direction are: Classroom and tutorial room complex, laboratory complex for first year students, two new halls of residence for boys of 2,000 capacity each, a hall of residence for girl students, 144 apartments for faculty and several apartments for employees. Construction of a 100 room guesthouse is in progress and is expected to be completed by the end of 2008. The work for Rajiv Gandhi School of Intellectual Property Law building is progressing steadily and will be completed soon. The construction activities for an extension building and a 200-capacity hostel for boys at Bhubaneswar Campus have started. Apart from these, a major revamp in the existing infrastructure such as widening of roads, upgrading of existing sewers and water supply lines, construction of riverbank deep tube-wells at Anicut Pump House, augmentation of the main power receiving substation and doubling of capacities of the existing substations are in progress.

INTERNATIONAL COLLABORATION

Accelerated progress in many endeavors of the Institute is possible only through active collaborations. We have several collaborations in different areas of research and development, faculty and student exchange programs. Collaborations at different levels are going on with University of Tokyo, Japan, University of New South Wales, Sydney, Aachen University, Germany, Cambridge University, UK, Swiss Federal Institute of Technology, Zurich, EPFL, Switzerland, Dresden University, Germany, University of British Columbia, Vancouver, Canada, City University, Hong Kong, University of Heidelberg, Germany, Virginia Commonwealth University, University of Birmingham, UK, King Fahd University of Petroleum & Minerals, Kingdom of Saudi Arabia, Georgia Tech. University, USA and University of California Berkeley, USA.

In the last year, the Institute has signed MOU for academic and research activities with several universities of USA, Germany, Korea and Italy, including University of Tokyo, Technical University Berlin, Syracuse University and University of Warwick.
SPONSORED RESEARCH AND INDUSTRIAL CONSULTANCY

Industry-academia partnership has attained new dimension in the year 2007-2008. Many technology-intensive and industrial houses are increasingly forming partnerships in joint research projects, acquiring technologies developed in the Institute and seeking consultancy supports from the Institute. Collaborations are also going on with Intel, National Semiconductors, Synopsys, Microsoft, General Motors, Orrick, National Oceanic and Atmospheric Administration of USA, and Geological Survey of Japan, SHELL International & Exploration BV of The Netherlands, DAV Norway and Texas Instruments of USA. During the year 2007-2008 the Institute received 196 research projects for a total value of Rs. 10,957 lakh and 169 consultancy projects for Rs. 1,677 lakh compared to 166 research projects for a total value of Rs. 4,407 lakh and 129 consultancy projects for Rs. 1,009 lakh. Thus a total of 365 sponsored projects were received during the year for a total value of Rs. 12,634 lakh from Government, private and international funding agencies/enterprises compared to 295 projects received during the previous year for a total value of Rs. 5,416 lakh.

STEP - IIT KHARAGPUR

Innovation is a step towards higher generation of growth and sustainability. Science and Technology Entrepreneurs Park (STEP), IIT Kharagpur is an emerging nodal center for innovation. It works towards translating some of the research outcomes of IIT faculty to commercially viable products. STEP IIT Kharagpur provides a single-window facility for turning individuals with science and technology background into successful entrepreneurs capable of generating value-added products. A global venture laboratory, in collaboration with the Jyvaskyla University, Finland and the University of California Berkeley, is being set up at STEP to further improve the skills of the budding entrepreneurs. There are a total of 24 resident entrepreneurs and 8 graduate entrepreneurs operating from STEP, apart from 31 other entrepreneurs who have also received assistance from STEP for initiating their ventures.

CONFERENCES, SYMPOSIA, SEMINARS AND WORKSHOPS

The Institute lays great emphasis on knowledge dissemination, and encourages organization of conferences, symposia and workshops. The year 2007-2008 saw Departments, Centers and Schools of the Institute organizing many such activities, which attracted a large number of participants from India and abroad.

The Fourth International Conference on "Theoretical, Applied, Computational and Experimental Mechanics" was held in the Department of Aerospace Engineering. The Department also conducted a two-day National Workshop on "Modeling of Fluids - Macro to Nano Scales". The Department of Agricultural and Food Engineering organized a national workshop on "Sustainability of Indian Aquaculture Industry" and the Nineteenth Indian Convention of Food Scientists and Technologists. Advanced Technology Development Centre held a workshop on "MEMS and Microelectronics". Workshops on "Bioinformatics in Genomics and Proteomics" and "Biohydrogen Production Technology" were organized by the Department of Biotechnology. The Cryogenic Engineering Centre has conducted workshops on "Cryogenic Air Separation" in Kolkata and Kharagpur. The Department of Computer Science and Engineering conducted a workshop on "Dynamics on and of
Network", in Dresden, Germany, as part of European Conference on Complex Systems. The Department of Electrical Engineering organized a workshop on "Energy: Crisis and Remedies", jointly with WBREDA, at Kolkata. The Department also organized Prof. Gene H. Golub memorial workshop on "Computation of Singular Value Decomposition", with IEEE Kharagpur Section and System Society of India.

A conference on "Advances in Space Science and Technology" was orgnaized by the Kalpana Chawla Space Technology Cell. The Cell also conducted workshops on "Communication and IP-Core Design", "MEMS and Cryogenics" and "Control and Materials". The Department of Metallurgical and Materials Engineering organized the national meet COMPOSIT (Congress of Metallurgical Professionals involving Students, Industry and Teachers). The Indo-Korean joint International Symposium on "Geo-Science and Technology : Utilization of Geo-space as a solution for Energy and Environment", was organized by the Department of Mining Engineering. The Department of Physics and Meteorology along with the Centre for Theoretical Studies organized workshops on "Physics of Warped Extra Dimensions" and "Quantum Correlation and Quantum Computing". The Reliability Engineering Center organized an international conference on Reliability and Safety Engineering. The Rural Development Center organized a workshop in connection with Rural Technology Action Group. The Rubber Technology Centre has organized an international conference on "Rubber and Rubber-like Materials". A workshop on "Globalization, Leadership and Business Strategies" was conducted by the Vinod Gupta School of Management.

CONTINUING EDUCATION PROGRAM

The Continuing Education Programme constitutes an important activity of the Institute. Over the years, it has diversified in terms of coverage of disciplines, duration of program, the level of the programs and the type of industries served. During the last one year, with AICTE support, twenty-four teachers from various engineering colleges have obtained their Doctoral degree and fourteen teachers their Master's degree. Fifteen teachers have enrolled for the Ph.D. program while twenty-one teachers have taken advance admission to the Ph.D. program. Forty-seven self-supported short-term courses, both on-campus as well as off-campus, have been conducted for professionals employed in industry and R&D organizations. Last year, 1,627 participants were awarded certificates on completion of the course works.

The CEP is in the process of starting part-time M.Tech. programmes in Computer Science and Engineering, Electronics and Electrical Communication Engineering and Electrical Engineering at its Kolkata, Bhubaneswar and Kharagpur Centres, primarily for faculty members of AICTE-sponsored engineering colleges.

LAURELS AND DISTINCTIONS

In the quest for excellence, teacher and students of IIT Kharagpur have been receiving awards and honours, laurels and distinctions. In the year 2007-2008, too, faculty members have been honoured with prestigious awards and were elected as Fellows of the National Science Academy and Indian National Academy of Engineering.
Dr. Suman Chakraborty of the Department of Mechanical Engineering has been awarded the prestigious Swarnajayanti Fellowship by the Department of Science and Technology, Government of India. Dr. Pabitra Mitra of the Department of Computer Science & Engineering has been selected for the INAE Young Engineer Award of the Indian National Academy of Engineering, New Delhi. Prof. Pratim Kumar Chattaraj of the Department of Chemistry and Prof. Soumitro Banerjee, Professor of the Department of Electrical Engineering are elected Fellows of the Indian National Science Academy, New Delhi. Prof. S. Dey of the Department of Civil Engineering, Prof. Jayanta Bhattacharya of the Department of Mining Engineering and Prof. Samit K. Ray of the Department of Physics & Meteorology are elected Fellows of the Indian National Academy of Engineering, New Delhi.

Prof. Sujit Roy of the Department of Chemistry and Prof. Anil Kumar Gupta of the Department of Geology & Geophysics are elected Fellows of the Indian Academy of Sciences, Bangalore. Prof. Anil Kumar Gupta has been elected as Life Fellow of the Indian Geophysical Union, Hyderabad. Prof. Tarasankar Pal of the Department of Chemistry was elected a Fellow of The National Academy of Sciences, Allahabad. Prof. Indranil Manna of the Department of Metallurgical & Materials Engineering has been awarded INAE-AICTE Distinguished Industry Professor (2007), by the Indian National Academy of Engineering and Tata Steel, Jamshedpur. Prof. A. Bhattacharya of the Department of Geology & Geophysics has been elected a Fellow of the West Bengal Academy of Science and Technology.

Dr. Suman Chakraborty of the Department of Mechanical Engineering has been awarded the Anil Kumar Bose Memorial Award (2007) of the Indian National Science Academy. Prof. Anupam Basu of the Department of Computer Science & Engineering has received the National Award for the Empowerment of the Persons with Disabilities 2007 by the Ministry of Social Justice and Empowerment, Government of India. Prof. Prem Chand Pandey of the Centre for Oceans, Rivers, Atmosphere and Land Sciences has received the Khosla National Award, by IIT Roorkee and Prof. K. R. Ramanathan Memorial Gold Medal and Citation, by the Indian Geophysical Union for his life-time achievements in the field of engineering. Prof. K. P. Pandey of the Department of Agricultural & Food Engineering has been awarded the Prof. C. V. Paul Gold Medal by the Indian Society of Agricultural Engineers. Prof. H. N. Mishra of the same Department has been awarded the AIFPA President's Award, by the All India Food Processors' Association. Prof. Uttam Banerjee of the Department of Architecture & Regional Planning has been awarded the Best Design for the Model Police Station by the Bureau of Police Research and Development. Prof. Debabrata Das of the Department of Biotechnology has been awarded the IAHE Akira Matsui Award. Dr. Saibal Ganguly of the Department of Chemical Engineering has received the V. A. Altekar Award by National Metallurgical Laboratory, CSIR. Prof. Debashis Roy of the Department of Chemistry has been awarded the bronze medal of the Chemical Research Society of India (CSRI). Prof. Pallab Dasgupta of the Department of Computer Science & Engineering has been awarded the IBM Faculty Award. Prof. Kanchan Chowdhury of the Cryogenic Engineering Centre has received the Endeavour Executive Award by Department of Education, Science & Training, Government of Australia. Dr. Pavitra Sandilya of the same Centre has received the V. A. Altekar Award by National Metallurgical Laboratory, CSIR. Dr. Manish A. Mamtani of the Department of Geology & Geophysics has been awarded the H. H. Read Memorial Gold Medal, by the Society of Geoscientists and Allied Technologists, Bhubaneswar. Prof. Subir Kumar Mukhopadhyay and Dr. Debasis Deb of the Department of Mining Engineering have been awarded the Institute's Gold Medal, by the MGMI, Kolkata. Prof. Samit K. Ray of the Department of
Physics & Meteorology has been awarded the Materials Research Society of India Medal.

ALUMNI AFFAIRS

The alumni of the Institute have played a significant role in facilitating increased interaction of IIT Kharagpur in India and abroad. Shri Ranbir Singh Gupta, an alumnus has pledged US$1 Million to IIT Kharagpur for the establishment of a School of Infrastructure. The Ranbir & Chitra Gupta School of Infrastructure Design and Management is going to have its first M.Tech. programme from the session 2008-2009. The Nina Saxena Excellence in Technology Award, instituted last year in memory of Dr. Nina Saxena B.Tech. (Hons.), ECE 1992, for technical innovation was awarded to Dr. S. P. S. Khanuja, Director, Central Institute of Medicinal & Aromatic Plants, Lucknow. The New Year brought together the alumni of the Institute in the Fifth Annual Alumni Meet 2007 held during January 2008. The Meet was organized for the graduates of 1958 and 1983.

TRAINING AND PLACEMENT

The Training and Placement Section of the Institute is actively engaged in forging synergistic relationships between the Institute and various industries and employers of technical and scientific manpower. During 2007-2008, 146 companies and organizations visited the campus for taking placement interviews. In addition, 14 companies have called the students for interviews to their office. The undergraduate students placement in the year has been 98% with an average salary of Rs. 7.44 lakhs per year. Harnessing student power has been very fruitful and students effectively ensured that placement programs were run continuously as per schedule during the placement process. A total of 130 companies have offered summer training to the students and 94 of them provided financial assistance. Last year, 350 students of the Institute have taken summer training in countries outside India. For the first time in the Institute, a Deferred Placement Program has been introduced to boost entrepreneurship amongst graduating students. The idea behind such program is to encourage students to take up entrepreneurial ventures while simultaneously offering them a safety net in case the venture does not take off.

STUDENTS' AFFAIRS

In pursuit of excellence and giving life a meaningful direction, Technology Students Gymkhana of IIT Kharagpur works towards personality development of IIT students by infusing in them a spirit of constructive cooperation, leadership qualities and organizational capabilities. This is being achieved by involving them in a wide spectrum of Sports and Games as well as Social & Cultural and Technological activities throughout the year. The year 2007-2008 was also full of activities and achievements and proved to be matching the high standards of organizational and leadership capabilities of our students.

The Inter-IIT Aquatics Meet was held from 2nd October to 5th October 2007 at IIT Bombay. IIT Kharagpur got overall 2nd position in Swimming. The Annual Athletics Meet was held during 3rd and 4th November 2007. The 43rd Inter-IIT Sports meet was held at IIT Bombay from 13th December to 21st December 2007. IIT Kharagpur secured Silver Medal in Badminton, and Bronze in Weight Lifting, Basketball and Cricket. The big bonanza of Social
and Cultural activities was organized from 24th January to 28th January 2008 that witnessed the organizational powers of IIT students.

To keep IIT Kharagpur students in a leading role in the changing world scenario, the techno-management festival, Kshitij was successfully organized from 1st February to 4th February 2008 which included a multitude of technical and managerial events. In the year 2007-2008, 20 Institute Blues and 12 Order of Merits have been awarded to the students for their outstanding achievements in Sports and Games, Social & Cultural, and Technological activities.
PART - I

DEPARTMENTS CENTRES AND SCHOOLS
DEPARTMENTS, CENTRES AND SCHOOLS

IIT Kharagpur is a wholly residential Institute with a large campus spread over an area of approximately 600 hectares. It has a student population of approximately 6600. The sanctioned faculty strength of the Institute is 524. As per faculty : students ratio of 1 : 10, the faculty strength has to be increased to 660.

The Institute has 19 Departments, 7 Centres and 5 Schools. These are:

Departments:


Centres:

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

Schools:

G. S. Sanyal School of Telecommunications, Rajiv Gandhi School of Intellectual Property Law, School of Information Technology, School of Medical Science & Technology and Vinod Gupta School of Management.
Aerospace Engineering

B.Tech. (Hons.) in Aerospace Engineering
M.Tech. in Aerospace Engineering
M.Tech. Dual Degree 5 years in Aerospace Engineering
Ph.D.

Agricultural and Food Engineering

B.Tech. (Hons.) in Agricultural and Food Engineering
M.Tech. in Agricultural Engineering with specialization in:
   i) Farm Machinery and Power
   ii) Soil & Water Conservation Engineering
   iii) Agricultural Systems & Management
   iv) Applied Botany
   v) Water Resources Development and Management
   vi) Aquacultural Engineering
   vii) Dairy & Food Engineering
   viii) Post Harvest Engineering
M.Tech. Dual Degree 5 years in Agricultural & Food Engineering in any chosen specialization
Ph.D.

Architecture and Regional Planning

B.Arch. (Hons.) in Architecture
 Master of City Planning
Ph.D.

Biotechnology

B.Tech. in Biotechnology & Biochemical Engineering
M.Tech. in Biotechnology and Biochemical Engineering
M.Tech. Dual Degree 5 years in Biotechnology & Biochemical Engineering
Ph.D.

Chemical Engineering

B.Tech. (Hons.) in Chemical Engineering
M.Tech. in Chemical Engineering
M.Tech. Dual Degree 5 years in Chemical Engineering
Ph.D.

Chemistry

Faculty Strength – 524 as on 31.03.2008
Integrated M.Sc. (5 yr.) in Industrial Chemistry
M.Sc. (2 yr.) in Chemistry
Ph.D.

Civil Engineering 27

B.Tech. (Hons.) in Civil Engineering
M.Tech. in Civil Engineering with specialization in:
   i) Structural Engineering
   ii) Geotechnical Engineering
   iii) Hydraulic & Water Resources Engineering
   iv) Environmental Engineering & Management
   v) Transportation Engineering
M.Tech. Dual Degree 5 years in Civil Engineering in any chosen specialization
Ph.D.

Computer Science and Engineering 19

B.Tech. (Hons.) in Computer Science and Engineering
M.Tech. in Computer Science & Engineering
M.Tech. Dual Degree 5 years in Computer Science & Engineering / Computer & Information Technology
Ph.D.

Electrical Engineering 28

B.Tech. (Hons.) in Electrical Engineering
B.Tech. (Hons.) in Energy Engineering
B.Tech. (Hons.) in Instrumentation Engineering
M.Tech. in Electrical Engineering with specialization in:
   i) Machine Drives and Power Electronics
   ii) Power Systems Engineering
   iii) Control Systems Engineering
   iv) Instrumentation
M.Tech. Dual Degree 5 years in Electrical Engineering in any chosen specialisation
Ph.D.

Electronics and Electrical Communication Engineering 28

B.Tech. (Hons.) in Electronics and Electrical Communication Engineering
M.Tech. in Electronics and Electrical Communication Engineering with specialization in:
   i) Telecommunication Systems Engineering
   ii) RF & Microwave Engineering
   iii) Microelectronics & VLSI Design
   iv) Visual Information & Embedded Systems
M.Tech. Dual Degree 5 years in Electronics & Electrical Communication in any chosen specialization
Ph.D.

Centre for Educational Technology 03
M.Tech. in Media and Sound Engineering
Ph.D.

**Geology and Geophysics** 22

Integrated M.Sc. (5 yr.) in
i) Applied Geology
ii) Exploration Geophysics
M.Sc. (2 yr.) in
i) Geological Sciences
ii) Geophysics
M.Tech. in
i) Earth & Environmental Engineering
ii) Computational Seismology
Ph.D.

**Humanities and Social Sciences** 25

Integrated M.Sc. (5 yr.) in Economics
M.Tech. in Human Resources Development and Management
Ph.D.

**Industrial Engineering and Management** 13

B.Tech. (Hons.) in Industrial Engineering
M.Tech. in Industrial Engineering and Management
M.Tech. Dual Degree 5 years in Industrial Engineering / Industrial Engineering and Management
Ph.D.

**Mathematics** 27

Integrated M.Sc. (5 yr.) in
i) Mathematics and Computing
ii) Statistics and Informatics
M.Sc. (2 yr.) in Mathematics & Statistics and Informatics
M.Tech. in Computer Science and Data Processing
Ph.D.

**Mechanical Engineering** 42

B.Tech. (Hons.) in Mechanical Engineering
B.Tech.(Hons.) in Manufacturing Science and Engineering
M.Tech. in Mechanical Engineering with specialization in :
i) Manufacturing Process Engineering
ii) Thermal Energy & Environmental Engineering
iii) Mechanical Systems Design
iv) Mechanical Systems, Dynamics & Control
M.Tech. Dual Degree 5 years in any chosen specialization :
i) Manufacturing Science & Engineering / Industrial Engineering & Management
ii) Mechanical Engineering (M.Tech. in any chosen Specialization)
Ph.D.

**Metallurgical & Materials Engineering**

B.Tech. (Hons) in Metallurgical Engineering
M.Tech. in Metallurgical & Materials Engineering
M.Tech. Dual Degree 5 years in Metallurgical & Materials Engineering / Metallurgical Engineering
Postgraduate Diploma in Steel Technology
Ph.D.

**Mining Engineering**

B.Tech. (Hons.) in Mining Engineering
M.Tech. in Mining Engineering
M.Tech. Dual Degree 5 years in Mining Engineering
i) Mining Engineering
ii) Mining Engineering / Disaster Management in Mines
Ph.D.

**Ocean Engineering and Naval Architecture**

B.Tech. (Hons.) in Ocean Engineering and Naval Architecture
M.Tech. in Ocean Engineering & Naval Architecture
M.Tech. Dual Degree 5 years in Ocean Engineering & Naval Architecture
Postgraduate Diploma in Maritime Operation & Management
Ph.D.

**Physics and Meteorology**

Integrated M.Sc. (5 yr.) in Physics
M.Sc. (2 yr.) in Physics
M.Tech. in Solid State Technology
Ph.D.

**Centre for Oceans, Rivers, Atmosphere and Land Sciences**

M.Tech. in Earth System Science and Technology
Ph.D.

**Cryogenic Engineering**

M.Tech. in Cryogenic Engineering
Ph.D.

**Materials Science**
M.Tech. in Materials Science and Engineering
Ph.D.

**Reliability Engineering Centre** 04
M.Tech. in Reliability Engineering
Ph.D.

**Rubber Technology** 10
M.Tech. in Rubber Technology
Ph.D.

**Rural Development** 05
Post Graduate Diploma in Rural Development
Ph.D.

**G. S. Sanyal School of Telecommunications** 02
Postgraduate Diploma in Telecommunications Networking Planning and Management
Ph.D.

**Rajiv Gandhi School of Intellectual Property Law** 08
LLB in Intellectual Property Law
Postgraduate Diploma in Intellectual Property Law
Ph.D.

**School of Information Technology** 07
M.Tech. in Information Technology
Postgraduate Diploma in Information Technology
Ph.D.

**School of Medical Science & Technology** 10
M.Tech. in Medical Imaging and Image Analysis
Master in Medical Science and Technology
Ph.D.

**Vinod Gupta School of Management** 16
i) Master of Business Administration
ii) Postgraduate Diploma in Business Administration
iii) Postgraduate Diploma in Management
DEPARTMENT OF AEROSPACE ENGINEERING

HEAD : Professor Navtej Singh

FACULTY

Professor :

Ghosh, Amit Kumar  Ph.D. (IIT, Madras), Aircraft Propulsion
Bandyopadhyay, Gautam  Ph.D. (IIT, Kharagpur), Aerodynamics
Singh, Navtej  Ph.D. (IIT, Kharagpur), Aerodynamics
Dutta, P. K.  Ph.D. (Georgia Tech), Aircraft structures

Associate Professor :

Singh, B. N.  Ph.D. (IIT, Kanpur), Structures
Maiti, D. K.  Ph.D. (IIT, Kharagpur), Structures
Sinha Mahapatra, K. P.  Ph.D. (IIT, Kharagpur), Aerodynamics
Laha, M. K.  Ph.D. (IIT, Kharagpur), Aerodynamics / Flight Mechanics
Rao, T. V.  Ph.D. (IISc, Bangalore), Aircraft propulsion

Assistant Professor :

Ghosh, A.  Ph.D. (IIT, Kharagpur), Structures
Roy, A.  Ph.D. (IIT, Kharagpur), Aerodynamics
Pradhan, S. C.  Ph.D. (IIT, Kanpur), Aircraft Structures
Sinha, M.  Ph.D. (IIT, Kanpur), Flight Mechanics and Control

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities :

1. Composite & Smart Structures
2. Structural Dynamics & Aeroelasticity
3. Design & Development of MR-fluid damper
4. Low Reynolds number airfoils for micro air vehicles
5. High Reynolds number three dimensional flows
6. Supersonic and hypersonic flows for various configurations
7. Analysis of aerospace structures using DQM, DTFM, FEM
8. Nanomaterials and nanomechanics
9. Development of reconfigurable autonomous air vehicle
10. Lunar gravity modeling, topography modeling and orbit determination for the Chandrayaan-I
11. Fault tolerant and reconfigurable architecture development for the automotive
12. Real time system identification, system identification using neural sensitivity analysis
13. Fault detection and identification for aircraft
Development of micro-aerial vehicles

**Thrust Areas:**

2. Composite and smart structures, probabilistic analysis & design
3. Autonomous reconfigurable flight vehicle development, Chandrayaan-I project

**New Acquisitions:**

1. Upgradation Intron 1342 (Dynamic Machine)
2. Vibration shake table
3. Sun Ultra-45 workstation with 16 GB RAM & dual processor core
4. 12 noded 12 X 2 GB RAM PC cluster
5. Laminar Flow Table
6. 16-channel pressure scanner system
7. Low speed wind tunnel
8. High speed data acquisition card, 16M Samples/s
9. Shock Accelerometer
10. Various models of and components for micro-aerial vehicles
11. An “Intelligent Systems Research Laboratory” has been set up in the Department for R&D in the area of intelligent flight management

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects:**

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Centre of Excellence for Composite Structures Technology Phase II</td>
<td>AR&amp;DB</td>
<td>Rs. 75.90 Lakh</td>
</tr>
<tr>
<td>2.</td>
<td>Aeroelastic Tailoring of a Composite Lifting Surface Using Smart Structures Concept</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.0 Lakh</td>
</tr>
<tr>
<td>3.</td>
<td>Aeroelastic Analysis of a Lifting Surface Employing Active Fiber Composite Under Hygro-Thermal Environment</td>
<td>AR&amp;DB</td>
<td>Rs. 8.96 Lakh</td>
</tr>
<tr>
<td>4.</td>
<td>FİST Program</td>
<td>DST, New Delhi</td>
<td>Rs. 105.00 Lakh</td>
</tr>
<tr>
<td>5.</td>
<td>Non-linear vibration study of smart laminated composite plates with uncertain system properties in random hygrothermal environments</td>
<td>AR&amp;DB</td>
<td>Rs. 5.94 Lakh</td>
</tr>
<tr>
<td>6.</td>
<td>Dynamic Characteristics of thermally post-buckled composite panels embedded with SMA Fibers</td>
<td>DRDO</td>
<td>Rs. 7.70 Lakh</td>
</tr>
<tr>
<td>7.</td>
<td>Non-linear response of piezoelectric laminated composite panels under different loading conditions with uncertain system properties</td>
<td>IIT Kharagpur</td>
<td>Rs. 1.64 Lakh</td>
</tr>
<tr>
<td>8.</td>
<td>Experimental and Numerical Investigation</td>
<td>IIT Kharagpur</td>
<td>-</td>
</tr>
</tbody>
</table>
of Flow Past Two-Dimensional Arbitrary Body Geometries at Subsonic and Supersonic Speeds

   AR&DB, Aerodynamics Panel, GOI

10. Aerodynamic Investigation of Smart Flying Wing MAV
    Asian Office of Aerospace R&D, AOARD (AFRL), Japan

11. Research activities in computational fluid dynamics
    HyPerComp, Inc., USA

12. Development of a three-dimensional unsteady implicit hypersonic viscous turbulent flow solver on an unstructured grid
    DRDL

13. Axisymmetric and Non-Axisymmetric, Subsonic and Supersonic Jet Aerodynamics-Aeroacoustics using the Three-Dimensional Navier-Stokes/Euler Coupled Simulation
    AR&DB

14. Three-dimensional unstructured grid generation for viscous flow computation about complex configurations using computational geometric technique
    DRDL

15. Setting Up of AR&DB’s Associate Centre of CFD at IIT Kharagpur
    AR&DB

16. Least-Square Finite Element Analysis of Adhesively Bonded Joints with Functionally Graded Material
    AR&DB

17. Autonomous Reconfigurable air vehicle
    TIFAC, DST, New Delhi

18. Lunar gravity modeling, topography modeling & orbit determination
    ISRO

19. Reconfigurable flight control system
    DRDO

20. Hybrid flight control system
    AR&DB

21. Intelligent flight control system
    IIT Kharagpur

22. Studies on Initiation and Propagation of Damage in Smart Composite Plates and Shells
    IIT Kharagpur

23. Composite Application Laboratory
    TIFAC, DST, New Delhi

Consultancy Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fault tolerant automotive systems</td>
<td>General Motors</td>
<td>Rs. 500.00 Lakhs</td>
</tr>
</tbody>
</table>

VISITS ABROAD BY FACULTY MEMBER
1. Prof. P. K. Datta Invited, as a part of the faculty exchange programme for guest lectures (Aerospace Engineering Department of Chosun University, Korea) First week of November, 2007
2. Dr. M. Sinha Present paper on path planning for MAV (Toulouse, France) September 17-21, 2007

INVITED LECTURES BY FACULTY MEMBERS
2. Dr. K. P. Sinhamahapatra ‘Transonic and Supersonic Cavity Flows”, March 06, 2008 (DRDL, Hyderabad)

THESES (Doctoral and MS)

# | Name of Scholar | Title of Thesis
--- | --- | ---
1. | Rajesh Kumar | Computation of Steady and Unsteady Transonic Over Aero-foils and Wings
2. | Suvendu Narayan Patel | Dynamic Stability of Laminated Composite Stiffened Shell Panels with Cutouts Subjected to Non-uniform In-plane Harmonic Edge Loading

LAURELS & DISTINCTIONS
1. Dr. Manoranjan Sinha Reviewer for the Journal of Institution of Engineers (India)

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED
DEPARTMENT OF AGRICULTURAL & FOOD ENGINEERING

HEAD : Professor Bimal Chandra Mal

FACULTY

Professor :

Banerjee, Rintu Ph.D. (IIT Kharagpur), Microbial Biotechnology, Environmental Biotechnology
Bhadoria, P. B. Singh Ph.D. (IIT Kharagpur), Soil Science
Das, Susanta Kumar Ph.D. (IIT Kharagpur), Food Engineering / Post Harvest Engineering
Datta, Ashis Kumar Ph.D. (Pennsylvania State University), Dairy and Food Process Engineering
Ghosh, Bijoy Chandra Ph.D. (IIT Kharagpur), Agronomy
Goswami, Tridib Kumar Ph.D. (IIT Kharagpur), Dairy and Food Engineering, Post Harvest Technology
Mal, Bimal Chandra Ph.D. (IIT Kharagpur), Soil and Water Conservation Engineering, Aquacultural Engineering
Mishra, Hari Niwas Ph.D. (IIT Kharagpur), Food Technology
Panda, Rabindra Kumar Ph.D. (IARI Delhi), Water Resources Development & Management, Soil and Water Conservation Engineering
Panda, Sudhindra Nath Ph.D. (PAU, Ludhiana), Soil and Water Engineering
Pandey, Keshaw Prasad Ph.D. (IIT Kharagpur), Farm Machinery and Power, Renewable Energy
Raghuvanshi, Narendra Singh Ph.D. (California University, Davis), Irrigation and Drainage Engineering, Soil and Water Conservation Engineering
Singh, Rajendra Ph.D. (IIT Kharagpur), Soil & Water Conservation Engineering, Irrigation and Drainage Engineering
Tewari, Virendra Kumar Ph.D. (IIT Kharagpur), Farm Machinery & Power, Ergonomics
Tiwari, Kamlesh Narayan Ph.D. (IARI Delhi), Soil & Water Conservation Engineering, Irrigation, Land & Water Resources Management

Associate Professor :

Das, Bhabani Sankar Ph.D. (Kansas State University), Soil Physics, Vadose Zone Hydrology
Dutta Gupta, Snehashish Ph.D. (Kalyani University), Plant Tissue Culture & Biotechnology
Jha, Madan Kumar Ph.D. (Japan), Groundwater Engineering
Majumdar, Gautam Chandra Ph.D. (IIT Kharagpur), Post Harvest Engineering, Food Engineering, Agri. Systems Management
Mallick, Nirupama Ph.D. (BHU, Varanasi), Environmental Biotechnology, Algal Biotechnology, Stress Physiology
Mitra, Adinpunya Ph.D. (East Anglia UK), Applied Botany
Mitra, Arunabha Ph.D. (Calcutta University), Aquaculture, Fisheries,
RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities:

1. Application of GIS in both command area and watershed management
2. Biodegradable and edible films for food packaging and making carry bags
3. Biodiesel production and its performance in diesel engines
4. Biofiltration Technology in Aquaculture
5. Climate change impact assessment on rice production
6. Development of a novel gravity aeration system
7. Development of a small hp tractor for small and marginal farmers
8. Development of fortified RTE health foods
9. Greenhouse in Floriculture
10. Innovative food processing technologies
11. Micro irrigation in Horticultural crops
12. Microwave assisted heating and drying of foods
13. Microwave puffing of rice and paddy
14. Modelling nutrient uptake, P efficiency of crops, Rhizosphere research
15. Organic farming for sustainable agriculture
16. Plant Phenolics: Biosynthesis of aromatic phenolic fragrance and phytomedicinals
17. Predicting drawbar performance of agricultural tractors
18. Prediction of draft of tillage implements and fuel consumption of 2WD tractors
19. Rapid control atmosphere storage of fruits

Thrust Areas:

1. Agricultural Biotechnology
2. Agricultural Biotechnology
3. Agronomy
4. Aquacultural Engineering
5. Biofuels
6. Control and Modified atmosphere storage
7. Eco-friendly aquaculture
8. Farm Machinery
10. Functional foods & nutraceuticals
11. Mechanization of food processing and value addition, particularly for traditional technologies
12. Microwave Application in Food Processing
13. Non traditional foods, nutraceuticals and functional food development
14. Novel food products processing technologies
15. Novel Value addition, Recirculatory Aquaculture Systems
16. Plant Nutrition
17. Precision Agriculture
18. Thermal behaviour / properties of food
19. Tractor and Machinery Systems

New Acquisitions:

1. Chlorophyll meter SPAD-502
2. Front end loader for agricultural tractors beyond 50 hp power capacity
3. Front end loader for agricultural tractors beyond 50 hp power capacity
4. Twin Screw Extruder for Food Materials
5. Water Purification System
6. YSI-Professional Plus Multi Water Quality Parameter Analyzer

ON-GOING RESEARCH PROJECTS

Sponsored Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>AICRP on PFTC and R&amp;D of Farm Implement &amp; Machinery</td>
<td>ICAR, New Delhi</td>
<td>Rs. 95.91 Lakhs</td>
</tr>
<tr>
<td>2.</td>
<td>AICRP on Post Harvest Technology</td>
<td>ICAR, New Delhi</td>
<td>Rs. 60.00 Lakhs</td>
</tr>
<tr>
<td>3.</td>
<td>Design characteristics of circular stepped cascade pump (CSCP) aeration system</td>
<td>IIT Kharagpur</td>
<td>Rs. 1.00 Lakh</td>
</tr>
<tr>
<td>4.</td>
<td>Development of Combined Tillage Implement for Improving Performance of Tractor-Implement Combination</td>
<td>CSIR, New Delhi</td>
<td>Rs. 9.82 Lakhs</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Funding Body</td>
<td>Amount</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>5.</td>
<td>Development of process technology for invitroenzymatic detoxification of food infected with aflatoxin B1 using horse radish peroxidase enzyme</td>
<td>DST, New Delhi</td>
<td>Rs. 6.5 Lakhs</td>
</tr>
<tr>
<td>7.</td>
<td>Development of recirculatory aquaculture systems based on bioremediation and integrated bioplastic production</td>
<td>-</td>
<td>Rs. 26.19 Lakhs</td>
</tr>
<tr>
<td>8.</td>
<td>Development of starch based products from Curcuma leucorrhiza (Palo)</td>
<td>DST, New Delhi</td>
<td>Rs. 78.00 Lakhs</td>
</tr>
<tr>
<td>9.</td>
<td>FIST Project for “Strengthening Teaching and Research in Water Resources Development and Management”</td>
<td>DST, New Delhi</td>
<td>Rs. 837.80 Lakhs</td>
</tr>
<tr>
<td>10.</td>
<td>Enhancing research capacity and Initiating Masters’ &amp; Doctoral Programmes in Food Science &amp; Technology</td>
<td>DBT, New Delhi</td>
<td>Rs. 837.80 Lakhs</td>
</tr>
<tr>
<td>11.</td>
<td>FIST Project in Water Resources Development &amp; Management</td>
<td>DST, New Delhi</td>
<td>Rs. 78.00 Lakhs</td>
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<tr>
<td>12.</td>
<td>FIST Project on Water Resources Development and Management</td>
<td>DST, New Delhi</td>
<td>Rs. 78.00 Lakhs</td>
</tr>
<tr>
<td>13.</td>
<td>Fully Biodegradable Starch Based Film for Making Carry Bag and Edible Food Packaging</td>
<td>Ministry of Environment &amp; Forest, New Delhi</td>
<td>Rs. 10.07 Lakhs</td>
</tr>
<tr>
<td>14.</td>
<td>Impact of climate change on rice yield of West Bengal: A field experiment and simulation study</td>
<td>IIT, Kharagpur</td>
<td>Rs. 2.70 Lakhs</td>
</tr>
<tr>
<td>15.</td>
<td>Improvement in technology for processing of khejur (Phoenix sylvestris) gur products and their storage characteristics</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>16.</td>
<td>Mechanised Food Engineering</td>
<td>IIT Kharagpur</td>
<td>Rs. 5.00 Lakhs</td>
</tr>
<tr>
<td>17.</td>
<td>Microwave Assisted Hot Air and Vacuum Drying of Fruits and Spices</td>
<td>Ministry of Food Processing Industries, New Delhi</td>
<td>Rs. 29.00 Lakhs</td>
</tr>
<tr>
<td>18.</td>
<td>Milled and malted product potential of kodo (Paspalum scrobiculatum L.)</td>
<td>-</td>
<td>-</td>
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<tr>
<td>19.</td>
<td>Precision Farming Development Centre</td>
<td>Ministry of Agriculture, New Delhi</td>
<td>Rs. 150.00 Lakhs</td>
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<tr>
<td>20.</td>
<td>Processing and preservation of fruits and vegetables at agro-processing complex</td>
<td>-</td>
<td>-</td>
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<tr>
<td>21.</td>
<td>Production and Performance Evaluation of Biodiesel from Tree Based Oils (with high free fatty acids) and their Mixtures</td>
<td>Ministry of Petroleum &amp; Natural Gas, New Delhi</td>
<td>Rs. 11.62 Lakhs</td>
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<tr>
<td>22.</td>
<td>Production of Spirulina powder and extraction of nutraceuticals</td>
<td>-</td>
<td>-</td>
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<tr>
<td>23.</td>
<td>Rapid control atmosphere storage of fruits</td>
<td>Ministry of Food</td>
<td>Rs. 48.00 Lakhs</td>
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</tbody>
</table>
24. Techno-Economic Feasibility of Integrated Aquaculture Options within Irrigation Systems

Consultancy Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
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<tbody>
<tr>
<td>1.</td>
<td>250 Kg tannery grade enzyme</td>
<td>Networks Export Pvt. Ltd.</td>
<td>Rs. 2.00 Lakhs</td>
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<td>2.</td>
<td>A small system for enhancing shelf life of fresh betel leaf</td>
<td>Private Party, Kaktia Bazar, Tamluk, East Midnapore</td>
<td>Rs. 0.04 Lakhs</td>
</tr>
<tr>
<td>3.</td>
<td>Evaluation Study on the Activities of Soil Conservation Department of Damodar Valley Corporation</td>
<td>Damodar Valley Corporation, Kolkata</td>
<td>Rs. 31.50 Lakhs</td>
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<tr>
<td>4.</td>
<td>Performance of Bias and Radial-ply Tyres</td>
<td>Apollo Tyres Ltd, Vadodara</td>
<td>Rs. 6.06 Lakhs</td>
</tr>
<tr>
<td>5.</td>
<td>Performance of Commercial Rice Mill</td>
<td>Maa Tara Rice Mill, Chandrakona Midnapore</td>
<td>Rs. 0.05 Lakhs</td>
</tr>
<tr>
<td>6.</td>
<td>Perspective Plan for Development of Pashimanchal, West Bengal</td>
<td>Government of West Bengal</td>
<td>Rs 11.50 Lakhs</td>
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<tr>
<td>7.</td>
<td>Rainwater Harvesting at Alumina Refinery, Damanjodi</td>
<td>National Aluminium Co. Ltd.</td>
<td>Rs. 4.16 Lakhs</td>
</tr>
</tbody>
</table>

VISITS ABROAD BY FACULTY MEMBER

1. Prof. P. B. S. Bhadoria Teaching (AIT Bangkok), December 1-7, 2007
2. Dr. M. K. Jha International Agricultural Engineering Conference (IAEC-2007), (Bangkok, Thailand), December 3-6, 2007
3. Prof. H. N. Mishra Indo-Australia Workshop on Functional Foods (University Wollongong, Australia), March 28-29, 2007
4. Dr. Adinpunya Mitra Future Trends in Phytochemistry : Compounds-Enzymes-Genes (Bad Herrenalb, Germany), March 26-29, 2008

INVITED LECTURES BY FACULTY MEMBERS

1. Prof. K. P. Pandey A series of six lectures on Tractor design and performance in Vehicle Integration Training Program
2. Prof. B. C. Mal Engineering Principles and Environmental Control for Sustainable Aquaculture in India (CIPHET, Ludhiana)
3. Prof. H. N. Mishra RTE Health Foods & Nutraceuticals (SNDT Women’s College, Mumbai)
4. Prof. H. N. Mishra Food processing technologies for rural entrepreneurs (KVIC, Nasik)
5. Prof. H. N. Mishra Functional (Health) foods (19th Annual Convention of Food Scientists & Technologists – ICFoST 2007)
6. Prof. Suresh Prasad Overview of Post Harvest Handling and Processing Technologies for Perishable Foods (Golden Jubilee Celebration Lecture Series of Central Institute of Fisheries Technology (CIFT), Cochin)
7. Dr. H. Raheman Performance of Diesel Engine with Blend of Jatropha (Jatropha curcas) Biodiesel and High Speed Diesel (Workshop on Awareness and Implementation of Biodiesel Fuel in India organized by University of Saskatchewan, Canada; IMMT Bhuaneswar and IIT Delhi)
8. Prof. K. N. Tiwari Remote Sensing and GIS application in Hydrological Modelling at Soil Conservation Dept. DVC Hazaribad, Jharkhand
9. Prof. K. N. Tiwari Remote Sensing and GIS application in Water Resources Management (Institution of Engineers (India) Kharagpur Local Centre)
10. Prof. B. C. Mal Role of Engineering on the Sustainability of Indian Aquaculture Industry (IIT Kharagpur)
11. Prof. B. C. Mal Role of Statistics in Agricultural Engineering Research (Birsa Agricultural University, Ranchi)
12. Prof. Suresh Prasad Use of Microwave Techniques in development of Instant Foods Based on Cereals and pulses (Defense Food Research Laboratory, Mysore)
13. Dr. P. S. Rao Value Addition to Aquatic Products, VIV India, through Nouvs International, Thailand (New Delhi)
14. Prof. B. C. Mal Water Harvesting- a Solution to Water Crisis (NERIST Itanagar)

LECTURE BY VISITING EXPERT

1. Mr. Arup Bose, Hydrodyne Inc., Kolkata Advantage of fitting Kort Nozzle in fishing vessel
2. Dr. G. S. Murthy, Biological and Ecological Engineering, Oregon State University, USA Oregon State University with a focus on Biological and Ecological Engineering Dept and potential opportunities for students at OSU
3. Dr. A. S. Upadhyay, NFDB, Hyderabad Schemes of funding by National Fisheries Development Board
4. Mr. Y. Ravikumar, Vaisakhi Bioresources Ltd., Visakhapatnam Shrimp Farming their problems and prospects
### THESES (Doctoral and MS)

<table>
<thead>
<tr>
<th>#</th>
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<th>Title of Thesis</th>
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<tbody>
<tr>
<td>1</td>
<td>Manisha Basu</td>
<td>Integrated nutrient management of sabai grass-peanut intercropping system in lateritic upland</td>
</tr>
<tr>
<td>2</td>
<td>S. K. Behera</td>
<td>Effect of Fertilization and Irrigation Schedule on Crop Response and Water-Solute Transport in Lateritic Soil</td>
</tr>
<tr>
<td>3</td>
<td>Alivia Chowdhury</td>
<td>Studies on the Groundwater Management of West Midnapore using Remote Sensing and GIS</td>
</tr>
<tr>
<td>4</td>
<td>K. K. Garg</td>
<td>Measurement and modeling water flow and nitrogen transport and transformation processing in low land paddy field</td>
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<tr>
<td>5</td>
<td>Amit Nath</td>
<td>Study on process technology for production of potato based ready-to-eat snacks</td>
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<tr>
<td>6</td>
<td>R. Rajani</td>
<td>Simulation-optimization modelling for efficient management of a coastal groundwater basin</td>
</tr>
<tr>
<td>7</td>
<td>K. Rajitha</td>
<td>Studies on Sustainable Development of Coastal Aquaculture through Remote Sensing and GIS</td>
</tr>
<tr>
<td>8</td>
<td>A. Sachan</td>
<td>Bioconversion of 4-coumaric acid to 4-hydroxybenzoic acid and caffeic acid by selected microorganisms</td>
</tr>
<tr>
<td>9</td>
<td>A. Sarma</td>
<td>Studies on design and performance of maize dehusker-cum-sheller</td>
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<tr>
<td>10</td>
<td>Susmita Sen</td>
<td>Management guidelines for wise Use of Freshwater wetlands: A community based approach for selected wetlands of West Bengal</td>
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<tr>
<td>11</td>
<td>V. K. Shiby</td>
<td>Dahi (Curd) Powder: Process technology, Storage &amp; Utilization</td>
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<tr>
<td>12</td>
<td>A. A. Singh</td>
<td>P dynamics and growth of maize and groundnut cultivars in alfisol</td>
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</table>

### BOOK PUBLISHED

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the Author(s)</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
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<tbody>
<tr>
<td>1</td>
<td>Prof. B. C. Bhattacharyya and Prof. Rintu Banerjee</td>
<td>Environmental Biotechnology</td>
<td>Oxford University Press</td>
<td>2007</td>
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<tr>
<td>3</td>
<td>Mr. R. S. Govindaraju</td>
<td>Moment analysis for</td>
<td>Springer, The</td>
<td>2007</td>
</tr>
</tbody>
</table>
and Dr. B. S. Das

4. Mr. Mainak Chakrabarti and Prof. Rintu Banerjee
   subsurface hydrologic applications
   Netherlands

5. Mr. S. S. Bhattacharyya and Prof. Rintu Banerjee
   Impact of tannery waste on the living system and its bioremediation in Environmental Pollution and Health Risk to Man and Animals
   -
   2008

PATENTS GRANTED

1. A process of preparing esterified karanja oil as a fuel for compression ignition engine and a fuel therefore; Patent No. 205 304, Date of Grant: 30/03/2007
2. Low fat absorbing self-supporting films made from food grade starch and other edible materials; Patent no: 209410

LAURELS & DISTINCTIONS

1. Prof. Suresh Prasad
   Awarded Best Poster Paper Award in the area of “Edible Oils and Oil Based Products” during ICFost 2007

2. Prof. Suresh Prasad
   Chairman, Research Advisory Committee (RAC) of CIFT, Cochin nominated by Indian Council of Agricultural Research, New Delhi, 2007

3. Prof. Suresh Prasad
   Member, High-level Expert Committee appointed by Director General, CSIR for recommending the winner of CAIRD-2007 Award

4. Prof. Suresh Prasad
   Chairman of the Consortium Advisory Committee (CAC) of the NAIP Project at CIPHET Ludhiana

5. Prof. Suresh Prasad
   Chairman, Quinquennial Review Team (QRT) of CIPHET, Ludhiana nominated by Director General ICAR, New Delhi

6. Prof. Suresh Prasad
   Member, Institute Research Committee, Indian Institute of Natural Resins and Gums, Ranchi

7. Mr. S. K. Sharma and Prof. K. N.
   Best Paper Award, Eleventh Annual
8. Prof. T. K. Goswami and Mr. S. Mangaraj
   Received best paper award in ICFoST-2007

9. Prof. T. K. Goswami and Mr. S. Mangaraj
   Received best paper award in ISAE, 2008

10. Dr. M. K. Jha
    ‘Outstanding Book Award’ by the Indian Society of Agricultural Engineers (ISAE), New Delhi in 2007

11. Prof. H. N. Mishra
    AIFPA Presidents’ Award for outstanding contribution in growth & development of food processing industry in 2007

12. Prof. H. N. Mishra
    Member, Editorial Board, Indian Food Packer, Published by All India Food Processors Association, New Delhi in 2007

13. Prof. H. N. Mishra
    President, Association of Food Scientists & Technologists (India) of Agricultural Engineers for his outstanding contribution in Agricultural Machinery Design in 2007

14. Prof. K. P. Pandey and Prof. C. V. Paul
    Awarded Gold Medal by the Indian Society in 2006-2007

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

1. Drip and Sprinkler Irrigation
   September 3-4, 2007

2. ICFoST 2007 – 19th Indian Convention of Food Scientists & Technologists

3. Microirrigation and Greenhouse Technology
   July 30-31, 2007

4. Microirrigation and Greenhouse Technology
   November 7-8, 2007

5. Microirrigation for Horticultural Crops
   October 4-5, 2007

6. National Workshop on Sustainability of Indian Aquaculture Industry
   -

7. National Workshop on Sustainability of Indian Aquaculture Industry
   September 28-29, 2007

8. Nineteenth Indian Convention of Food Scientists and Technologists
   -

9. Precision Farming in Horticultural Crops
   February 28-29, 2008

10. Pressurized Irrigation
    January 29-30, 2008

11. Short term course on Engineering and Management in Fisheries and Aquaculture
    April 29 – May 09, 2008

12. Workshop on RuTAg
    November 28, 2007
DEPARTMENT OF ARCHITECTURE & REGIONAL PLANNING

HEAD :  Professor Uttam Kumar Banerjee  (up to September 30, 2007)
        Professor Arif Noman Merchant  (from October 1, 2007)

FACULTY

Professor :


Datta, Rabindra N.  B.Tech. (Hons.), MCP, Ph.D. (IIT Kharagpur), FITP, Transportation Planning and City Planning

Merchant, Arif N.  B.Arch. (Hons.), (IIT Kharagpur), MCP, Ph.D. (Cincinnati, USA), AIIA, AITP, Community Planning, Urban Design, Architecture, Computer Applications, GIS & Remote Sensing

Sengupta, Biplab. K.  B.Arch.(Cal), MCP (IIT Kharagpur), AIIA, FITP, Urban Development Management, Planning Legislation, Metropolitan Planning, New Town Planning and City Planning

Associate Professor :

Barman, Jaydip  B.Arch.(Cal), MCP, Ph.D. (IIT Kharagpur), AIIA, FITP, AIID, MISTE, MISLE, Urban Design, Architecture, Visual Arts and Interior Design

Basu, Sanghamitra  B.Arch. (Hons.) (JU), PG Diploma in TCP (Hons) (SPA, Delhi), Ph.D. (IIT Kharagpur), Danida Fellow (Housing & Urbanisation, Denmark), MA in Conservation (York, UK), AIIA, AITP, Architecture, Urban & Regional Planning, Conservation

Chattopadhyay, Subrata  B.Arch. (Cal), MURP (SPA, Delhi), Ph.D. (IIT Kharagpur), Cert. Housing (Newcastle, UK), Dip. Housing (Lund, Sweden), AITP, Housing, Urban Planning and Building Materials

Sen, Somnath  B.Arch. (Hons.), MCP, Ph.D. (IIT Kharagpur), AIIA, AITP, Environmental Planning, Metropolitan Planning, GIS & Remote Sensing, Water Resources Planning

Sen, Joy  B.Arch. (Hons.) (IIT Kharagpur), MCRP(Iowa, USA), Minor in Technology and Social Change (UNDP, Iowa, USA), Ph.D. (IIT Kharagpur), AITP, Community & Regional Planning, Architectural Heritage, Historic Research & Documentation, Settlement Dynamics

Assistant Professor :
Ahmed Mokaddes Ali  
BE (Civil), MCP, Ph.D. (IIT Kharagpur), Transportation Planning

Chakraborty, Banhi  
MRP, Ph.D. (IIT Kharagpur), Regional Geography, Regional Planning, Rural Development

Dutta, Joydeep :  
B.Arch. (Hons.) (IIT Kharagpur), MUP (Illinois, USA), AIIA, AITP, Urban Design, Computer Applications and GIS, Retail Planning

Majumdar, Tapan K.  
B.Arch. (Cal), MCP(IIT Kharagpur), AIIA, AITP, MISTE, Building Construction, Industrial Architecture and Interior Design

Mazumder, Tarak N.  
B.Arch., MCP, Ph.D. (IIT Kharagpur), Transportation Planning, Transportation Economics, Urban Planning, Real Estate Evaluation

Paul, Saikat  
B.Arch., MCP (IIT Kharagpur), Environmental Planning, GIS & Remote Sensing, Climatology, Low cost Construction

Emeritus Professor :

Chattopadhyay, Rabindra N.  
M.Sc., MRP, Ph.D. (IIT Kharagpur), FITP, AAIP(USA), Rural Development and Regional Planning

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Faculty Appointment :

Dr. Banhi Chakraborty  Assistant Professor

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities :


3. **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)

4. **Urban Information System and Planning** (Urban Development Management and Finance, Advanced Planning Informatics, Geographical Information Systems,
Thrust Areas:

1. Energy efficient design,
2. Urban information system,
3. Traditional Architecture & heritage studies,
4. Visual Communication & Product Design,
5. Environmental planning & design,
6. Disaster Management,
7. Human settlements,
8. Housing,
9. Building Science,
10. Infrastructure Planning & Design

New Acquisitions:

1. Photography Laboratory is now fully functional with both colour as well as monochromatic developing and printing facilities
2. The Environment Laboratory is now fully functional with commissioning of indoor air quality measurement, outdoor weather monitoring station, and computer interfaced data logger

ON-GOING RESEARCH PROJECTS

Sponsored Projects:

<table>
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<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
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<tr>
<td>1</td>
<td>Development of Women Technology Park in Nayagram Tribal Block, West Midnapore</td>
<td>DST, New Delhi</td>
<td>Rs. 24.71 Laks</td>
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<tr>
<td>2</td>
<td>Study of Ancillary Industry of POSCO-India</td>
<td>POSCO Research Institute</td>
<td>Rs. 21.00 Laks</td>
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<td>3</td>
<td>National Programme for Capacity Building of Architects for Earthquake Risk Management</td>
<td>Ministry of Home Affairs, New Delhi</td>
<td>Rs. 25.45 Laks</td>
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<td>4</td>
<td>Historical Evolution of India - a new documentation</td>
<td>R.K.M. Institute of Culture, Kolkata</td>
<td>Rs. 3.00 Laks</td>
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<tr>
<td>5</td>
<td>Technology Development and Transfer for Selected Medicinal Plants : Approach through T&amp;D and Ex-situ-cultivation</td>
<td>National Medicinal Plants Board, New Delhi</td>
<td>Rs. 15.00 Laks</td>
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<td>6</td>
<td>Technology for vermi-compost plant at Orgram, Burdwan</td>
<td>Navsakti Cements Pvt. Ltd., Kolkata</td>
<td>Rs. 1.25 Laks</td>
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Consultancy Projects:

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<th>Title of the Project</th>
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<tbody>
<tr>
<td>1</td>
<td>Annexe Building of IIT Extension Centre,</td>
<td>IIT Kharagpur</td>
<td>Rs. 7.50 Laks</td>
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</tbody>
</table>
Salt Lake, Kolkata.

2. Architectural Design for New Academic Complex at Bankura Unnayani Institute of Engineering
   Bankura Unnayani Institute of Engineering, Subhankar Nagar, Pohabagan, Bankura
   Rs. 8.97Lakhs

   Vinod Gupta Charitable Foundation

4. Architectural Design for Rani Laxmi Bai Girls Hostel at IIT Kharagpur
   IIT Kharagpur
   Rs. 18.00 Lakhs

5. Architectural Design for Renovation of Tagore Open Air Theatre
   IIT Kharagpur
   Rs. 15.00 Lakhs

6. Architectural Design for Vikram Sarabhai Residential Complex for SRIC, IIT Kharagpur
   IIT Kharagpur
   -

7. Architectural design of Nalanda class room complex at IIT Kharagpur campus
   IIT Kharagpur
   Rs. 72.00 Lakhs

8. City Development Plan for Haldia
   Haldia Development Authority
   Rs. 22.47 Lakhs

9. Comprehensive technical consultancy services for town planning, landscape, architectural design and infrastructural facilities for MTPS township, DVC, Mejia
   Damodar Valley Corporation
   Rs. 112.36 Lakhs

10. Comprehensive technical consultancy services for town planning, landscape, architectural design and infrastructural facilities for KTPS township, DVC, Koderma
    Damodar Valley Corporation
    Rs. 146.06 Lakhs

11. Master Plan of National Institute of Technology, Silchar Campus
    NIT Silchar
    Rs. 5.61 Lakhs

12. Mobility Improvement Plan for Asansol
    Asansol Municipal Corporation
    Rs. 5.05 Lakhs

13. Mobility Improvement Plan for Durgapur-Asansol Planning Area
    Asansol Durgapur Development Authority
    Rs. 12.35 Lakhs

14. Mobility Improvement Plan for Haldia
    Haldia Development Authority
    Rs. 17.41 Lakhs

15. Perspective Development Plan for Paschimanchal
    Paschimanchal Unnayan Parishad, Government of West Bengal
    Rs. 11.02 Lakhs

16. Perspective Plan - Vision 2030 and Comprehensive Development Plans for Plan Areas of Bhubaneswar & Cuttack Dev. Authority
    Housing and Urban Development Department, Govt. of Orissa
    Rs. 165.29 Lakhs

17. Perspective Plan 2030 for Planning areas
    Asansol Durgapur
    Rs. 27.55 Lakhs
<table>
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<tr>
<th>Project Description</th>
<th>Organization</th>
<th>Cost (Lakhs)</th>
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<tr>
<td>Perspective Plan for Midnapore Kharagpur</td>
<td>MKDA Development Authority</td>
<td>18.08</td>
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<td>Population Holding Capacity of Hyderabad</td>
<td>Municipal Corporation of</td>
<td>17.50</td>
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<td>Aizawl Master Plan</td>
<td>Aizawl Development Authority,</td>
<td>70.22</td>
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<td></td>
<td>Mizoram</td>
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<td>Preparation of City Development Plan for Burdwan Planning Area</td>
<td>Burdwan Development Authority</td>
<td>11.23</td>
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<td>Preparation of Concept Note &amp; EOI for establishment of Biotechnology Park at</td>
<td>West Bengal Industrial</td>
<td>26.45</td>
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<tr>
<td>Kharagpur</td>
<td>Development Corporation Ltd.</td>
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<td>Rapid Appraisal and Planning for Kulti and Panagarh</td>
<td>ADDA</td>
<td>5.05</td>
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<td>Traffic Studies for Development of Spencer Mall, Kolkata, SYSTRA Consulting India</td>
<td>SYSTRA Consulting India Pvt.</td>
<td>2.0</td>
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<td>Ltd., (May 2007 onwards)</td>
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<td>Traffic Study for Project- ITC East India, Kolkata</td>
<td>ITC Limited</td>
<td>2.7</td>
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<td>Traffic Study for the Proposed Mixed Use Township Complex in Kasba Area, Kolkata</td>
<td>Bengal-NRI</td>
<td>2.4</td>
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<tr>
<td>Urban Environmental Information System and Environmental Profile for the ecocity</td>
<td>GTZ ASEM, Indo-German</td>
<td>15.03</td>
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<td>project towns of Puri, Ujjain and Vrindavan</td>
<td>Environment Programme</td>
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</table>

**VISITS ABROAD BY FACULTY MEMBER**

1. Dr. Subroto Chattopadhyay
   - Attended World Congress on Housing Science and networking, September 3-8, 2007

**LECTURE BY VISITING EXPERT**

1. Ron Gupta
   - Mission Critical Facility Design and Fast Track Design
2. Sandipan Bhattacharya
   - Works by LSA, USA in Metro Cities of India

**THESES (Doctoral and MS)**

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
1. **Basina Uma Sankar**  
Scheduling the Construction of Large Housing Projects: A Simulation-based Optimization Method

### BOOK PUBLISHED

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the Author(s)</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
</tr>
</thead>
</table>

### LAURELS & DISTINCTIONS

1. Prof. Uttam Banerjee  
Awarded the Best Design for the Model Police Station, organized by the Bureau of Police Research and Development in July 2007.

### SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

1. National Programme for Capacity Building of Architects for 3 Years Earthquake Risk Management (NPCBAERM), sponsored by Ministry of Home Affairs, Govt. of India.
DEPARTMENT OF BIOTECHNOLOGY

HEAD : Professor Ananta Kumar Ghosh

FACULTY

Professor :

Kundu, Subhas Chandra
Ph.D. (BHU, Varanasi), Molecular Genetics

Das, Debabrata
Ph.D. (IIT Delhi), Biochemical Engineering, Bioprocess Development, Environmental Biotechnology

Dey, Satyahari
Ph.D. (IIT Kharagpur), Microbial & Plant Biotechnology

Bioprospecting Transgenics & Molecular farming

Ghosh, Ananta Kumar
Ph.D. (Calcutta University), Molecular Virology

Das, Amit Kumar
Ph.D. (Calcutta University), Structural Biology & Protein Chemistry

Associate Professor :

Maiti, Tapas Kumar
Ph.D. (Kalyani University), Biochemistry

Ghosh, Sudip Kumar
Ph.D. (Kalyani University), Molecular Cell Biology and Immunology, Plant Biotechnology

Assistant Professor :

Sen, Ramkrishna
Ph.D. (IIT Madras), Biochemical & Bioprocess Engineering

Sar, Pinaki
Ph.D. (BHU, Varanasi), Environmental Microbiology

Biotechnology

Ghosh, Anindya Sundar
Ph.D. (Calcutta University), Microbial Genetics, Antimicrobial Chemotherapy

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities :

1. Process development & optimization for the production of an anti-tumor biosurfactant
2. Alkaline lipase production
3. Production of Bio-diesel and its evaluation
4. Bioremediation of heavy metals, radionuclides and organic pollutants; molecular analysis of microbial community structure and function at contaminated sites
5. Development of methods of o-antigens and its relation with pathogenicity in Gram negative bacteria
6. Bioreactor strategies for the enhanced production of probiotic endospores for Nutraceutical formulations and their clinical evaluation
7. Molecular characterization of metronidazole activation and deactivation pathways in Entamoeba histolytica
8. Molecular cloning and expression of E. invadens chitinase
9. Recombinant protein (therapeutic & diagnostic) expression in plant, animal and microbial systems
10. Structural and functional studies of protein from M. tuberculosis aiming at drug and inhibitor design
11. Improvement of hydrogen production from industrial waste using hybrid bioreactor
12. Continuous hydrogen production by immobilized recombinant E. coli BL-21
13. Establishment of EST database for tasar silkworm
14. Molecular analysis of cypovirus infecting tasar silkworm
15. Phytomedicine and molecular farming
16. Biomaterials and tissue engineering

Thrust Areas :
1. Biopharmaceuticals development (target and lead)
2. Bio-fuel
3. Bioremediation
4. Tissue Engineering

New Acquisitions :
1. Confocal microscope
2. LC MS-MS Bioanalyzer
3. Laboratory Microscope water purification system
4. Spray drier Lyophilyzer
5. UPS
6. X-ray diffraction machine for macromolecular crystallagrophy
7. Gel apparatus
8. Microcentrifuge

ON-GOING RESEARCH PROJECTS

Sponsored Projects :

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A study of micro scale transport processes leading to the development of cooling strategy for electronic components</td>
<td>DIT, New Delhi</td>
<td>Rs. 89.75 Lakhs</td>
</tr>
<tr>
<td>2</td>
<td>Amelioration of hydrogen production from sewage sludge using Enterobacter Cloacae IIT-BT 08</td>
<td>DBT, New Delhi</td>
<td>Rs. 14.03 Lakhs</td>
</tr>
<tr>
<td>3</td>
<td>Baseline survey of microbial community structure present in uranium mine areas of UCIL Jaduguda, Jharkhand</td>
<td>DAE, Mumbai</td>
<td>Rs. 23.62 Lakhs</td>
</tr>
<tr>
<td>4</td>
<td>Bio hydrogen production by investigation on the hydrgenease coding gene of high yielding strain of</td>
<td>USA</td>
<td>Rs. 5.25 Lakhs</td>
</tr>
</tbody>
</table>
Enterobacter cloacae IITBT08 in fast growing E.coli

5. Bioinformatics SUB-DIC Programme-DIC
   DBT, New Delhi Rs. 10.00 Lakhs

6. Bioprocess Development & Optimization for the production and characterization of a Bio surfactant of Marine origin for commercial & Health care Applications
   DBT, New Delhi Rs. 35.16 Lakhs

7. Bioprocess Development and Optimization for the Production of an Anti-tumor Biosurfactant
   IIT Kharagpur Rs. 3.00 Lakhs

8. Bioprocess Development, Optimization and Bioreactor Strategies for the Laboratory Scale Manufacture of Nutraceutical Formulations
   CSIR, New Delhi Rs. 13.00 Lakhs

   DAE, Mumbai Rs. 10.00 Lakhs

10. Characterization of silk protein sericin from Indian tropical tasar silkworms
    DST, New Delhi Rs. 23.18 Lakhs

11. Characterization of two histidine kinases and their cognate response regulator involved in signal Transduction system of Mycobacterium tuberculosis
    DBT, New Delhi Rs. 23.68 Lakhs

12. Cloning and characterization of a fungal protease inhibitor from the hemolymph of tasar silkworm Antheraea mylitta
    ICMR, New Delhi Rs. 18.00 Lakhs

13. Crystal structure determination of a β-Carbonic anhydrase (mCA) from Mycobacterium tuberculosis
    DST, New Delhi Rs. 19.88 Lakhs

14. Development of silk proteins based biomaterials (SPB)
    DBT, New Delhi Rs. 28.00 Lakhs

15. Establishment of an in vivo Method for Detection of O-antigens in Gram-Negative Bacteria
    DBT, New Delhi Rs. 21.00 Lakhs

16. Extraction characterization and optimized production of a natural dye from Amaranthus for commercial applications
    DBT, New Delhi Rs. 24.40 Lakhs

17. FIST program in Biotechnology
    DST, New Delhi Rs. 105.00 Lakhs

18. Functional characterization of soluble penicillin-binding protein 6 of E. coli
    DST, New Delhi Rs. 21.38 Lakhs

19. Improvement of hydrogen production from industrial wastes using hybrid bioreactor
    DBT, New Delhi Rs. 23.72 Lakhs

20. Maximization of gaseous energy recovery by simultaneous hydrogen production and bio methanation
    DBT, New Delhi Rs. 21.55 Lakhs

21. Microbial removal of heavy metals and...
<table>
<thead>
<tr>
<th>No.</th>
<th>Project Title</th>
<th>Funding Agency</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.</td>
<td>Microorganism based bioremediation of radionuclides from industrial wastes</td>
<td>CSIR, New Delhi</td>
<td>Rs. 13.46 Lakhs</td>
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<tr>
<td>23.</td>
<td>Modernization and up gradation of Biochemistry and Down stream processing Laboratory</td>
<td>MHRD, New Delhi</td>
<td>Rs. 13.00 Lakhs</td>
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<tr>
<td>24.</td>
<td>Molecular cloning and characterization of Antheraea mylitta cytoplasmic polyhedrosis virus genome segments 8 and 11</td>
<td>CSIR, New Delhi</td>
<td>Rs. 10.70 Lakhs</td>
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<tr>
<td>25.</td>
<td>Molecular epidemiology and identification of immunodominant antigen of Entamoeba in amoebic patients</td>
<td>ICMR, New Delhi</td>
<td>Rs. 20.00 Lakhs</td>
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<tr>
<td>26.</td>
<td>Optimisation of human fibroblast growth factors (diagnostic)production in recombinant plant cells in bioreactor</td>
<td>MHRD, New Delhi</td>
<td>Rs. 12.00 Lakhs</td>
</tr>
<tr>
<td>27.</td>
<td>Optimization and production of Antheraea mylitta cytoplasmic polyhedrosis virus anti-polyhedrin monoclonal antibody in bioreactor</td>
<td>MHRD, New Delhi</td>
<td>Rs. 12.00 Lakhs</td>
</tr>
<tr>
<td>28.</td>
<td>Scale-up studies on production of hydrogen from Enterobacter cloacae IIT-BT 08</td>
<td>MNCES, New Delhi</td>
<td>Rs. 24.90 Lakhs</td>
</tr>
<tr>
<td>29.</td>
<td>Scale-up studies on the production of therapeutically important protein (FGF 8) by recombinant E. coli (Ministry of Human Resource Development</td>
<td>DST, New Delhi</td>
<td>Rs. 12.00 Lakhs</td>
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<tr>
<td>30.</td>
<td>Screening of Aloe vera L germplasms for cosmetic gel and micropropagation of elite clones</td>
<td>DST, New Delhi</td>
<td>Rs. 14.58 Lakhs</td>
</tr>
<tr>
<td>31.</td>
<td>Silencing of gene expression in protozoan parasite Entamoeba histolytica by RNAi</td>
<td>CSIR, New Delhi</td>
<td>Rs. 14.00 Lakhs</td>
</tr>
<tr>
<td>32.</td>
<td>Structural and functional studies of major pathogenic proteins of <em>M. tuberculosis</em> (Part -II) (Indo-Norwegian Institutional Cooperation Programme</td>
<td>INICP, New Delhi</td>
<td>Rs. 31.75 Lakhs</td>
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<tr>
<td>33.</td>
<td>Studies on magnetic nanoparticle assisted hyperthermia activation of endiynes in cancer cells</td>
<td>DBT, New Delhi</td>
<td>Rs. 29.61 Lakhs</td>
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<tr>
<td>34.</td>
<td>Studies on the Fe-hydrogenase genes of prokaryotes and eukaryotes for the improvement of hydrogen production</td>
<td>DST-DAAD, New Delhi</td>
<td>Rs. 3.92 Lakhs</td>
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<tr>
<td>35.</td>
<td>Studies on the immunomodulatory properties of Aloe vera gel and its products</td>
<td>DARL, New Delhi</td>
<td>Rs. 9.97 Lakhs</td>
</tr>
<tr>
<td>36.</td>
<td>Synthesis characterization and DBT, New Delhi</td>
<td>Rs. 60.72 Lakhs</td>
<td></td>
</tr>
</tbody>
</table>
application of surface functionalized magnetic metal nano-particles for bioseparation and diagnostics

37. Technology development & transfer for selected medicinal plants: approach through R&D and ex-situ cultivation
   Sponsor(s): NMPB, New Delhi
   Amount: Rs. 15.00 Lakhs

38. Understanding the signalling mechanism from the crystal structures of the two component system proteins and protein phosphatases of Mycobacterium tubercu
   Sponsor(s): DBT, New Delhi
   Amount: Rs. 292.80 Lakhs

39. Exploration of microbial diversity and catabolic potential in contaminated environment: prospect to bioremediation
   Sponsor(s): DST, New Delhi
   Amount: Rs. 11.80 Lakhs

40. Exploring the immunopotential of mushroom glucan/proteoglucan as biological response modifier
   Sponsor(s): DST, New Delhi
   Amount: Rs. 24.49 Lakhs

41. Cell culture inside the microfluidic channels with extended air water interface
   Sponsor(s): DBT, New Delhi
   Amount: Rs. 17.40 Lakhs

42. Molecular approach for monitoring drug resistant malaria parasite in the malaria endemic zone in West Bengal
   Sponsor(s): DST, New Delhi
   Amount: Rs. 6.36 Lakhs

43. Silk Protein matrix for cell based tissue engineering
   Sponsor(s): IUSSTF, New Delhi
   Amount: Rs. 50.33 Lakhs

44. Biosynthetic silk hydrogel extra cellular matrix analogues for mammalian cell support and drug delivery
   Sponsor(s): DBT, New Delhi
   Amount: Rs. 45.42 Lakhs

Consultancy Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Establishment of Biotechnology Park Kharagpur: Concept paper</td>
<td>WBIDC</td>
<td>Rs. 24.00 Lakhs</td>
</tr>
<tr>
<td>2</td>
<td>Herbal / bioproduct development: preparation of preliminary report</td>
<td>B. Singha &amp; Co</td>
<td>Rs. 0.10 Lakhs</td>
</tr>
</tbody>
</table>

VISITS ABROAD BY FACULTY MEMBER

1. Prof. Subhas Chandra Kundu
   To attend International conference and to carry out part of collaborative research (Gwangju Institute of Science and Technology, Korea)

2. Prof. Subhas Chandra Kundu
   To present paper at International Conference on cellular & Molecular Bioengineering, Singapore

3. Prof. Subhas Chandra Kundu
   To discuss about the collaborative research work, Taiwan National University, Taiwan

4. Prof. Subhas Chandra Kundu
   To discuss about the collaborative work on Biomaterials, Kuala Lampur Medical University,
5. Prof. Subhas Chandra Kundu
   To present paper at International conference on fibrous protein, University of New South Wales, Sydney and Melbourne, Australia

6. Prof. Debabrata Das
   Invited lecture at the BIO Pacific Rim submit on Industrial Biotechnology and Bioenergy, Honolulu Hawaii, USA

7. Dr. Pinaki Sar
   BOYSCAST- Fellow, Department of Biochemistry and Cell Biology, Rice University, Houston, USA

INVITED LECTURES BY FACULTY MEMBERS

1. Prof. Subhas Chandra Kundu
   Application of mulberry and non mulberry silk proteins 2D films and 3D scaffolds (Taiwan National University, Taiwan)

2. Prof. Subhas Chandra Kundu
   Silk Protein matrices for cell based tissue engineering (GIST, Korea)

3. Prof. Subhas Chandra Kundu
   Silk Protein for cell based biomedical applications (IIT Kanpur)

4. Prof. Subhas Chandra Kundu
   Silk based biomaterials (San Diego, University of California)

5. Prof. Debabrata Das
   The Synergy of two-stage fermentation process: an approach towards amelioration of biohydrogen production (Aachen University, Germany)

6. Prof. Debabrata Das
   Biohydrogen production by Enterobacter cloacae : an approach towards commercialization (IIT Guwahati)

7. Dr. Ramkrishna Sen
   Biosurfactant enhanced environmental bioremediation (WBUT, Kolkata)

8. Prof. Satyahari Dey
   Investment opportunities utilizing plant resources (New Delhi)

9. Dr. Pinaki Sar
   Bioremediation : how it works and why to adopt this (Department of Civil Engineering, IIT Kharagpur)

LECTURE BY VISITING EXPERT

1. Dr. Nikhil Basu, Staff Scientist, National Institute of Health, Bethesda, Maryland, USA
   Phosphorylation of UDP-Glucuronosyl transferases : Its functional impacts on drug metabolism and detoxification

2. Dr. Arindam Banerjee, Scientist, Indian Institute of Chemical Biology, Jadavpur, Kolkata
   Nanomaterials in Biology

3. Dr. Jitendra Thakur, Department of Cell Biology, Harvard Medical School, USA
   Fungal analogs of metazoan nuclear receptors
4. Dr. Giyoong Tae, Department of Materials Science and Engineering, Gwangju Institute of Science & Technology (GIST), Korea
   Delivery of Biological Molecules

5. Prof. Young Ha Kim, Department of Materials Science and Engineering Gwangju Institute of Science & Technology (GIST), Korea
   Mechano-active tissue engineering

6. Dr. Saikat Chakrabarty, National Cancer for Biotechnology Information (NCBI), USA
   Towards understanding of structural, functional and evolutionary diversities among proteins

7. Dr. Ananda Sarkar, Cold Spring Harbor Laboratory, New York, USA
   Stem cell regulation and small RNA mediated organ patterning in higher plants

8. Dr. Penny Martens, University of New South Wales, Australia
   Synthetic Hydrogels for Tissue Engineering

9. Dr. Dipankar Chatterji, Indian Institute of Science, Bangalore
   Tracking a single molecule at the central dogma of Molecular Biology

10. Dr. Pratima Roy, All Indian Institute of Medical Sciences, New Delhi
    Development of Vaccine against childhood diarrhea

11. Dr. Jasim Ahamed, Rockfeller University, New York, USA
    Is there life after heart attack

12. Dr. Santosh Panjikar, EMBL Hamburg outstation, DESY, Germany
    Automated structure determination as a tool for validation of X-ray data and crystal structure determination of enzymes involved in Ajmaline Biosynthetic pathway

13. Dr. Srirupa Mukhopadhyay, Indian Institute of Chemical, Biology, Kolkata
    Role of 1 integrain activation in oxidized LDL mediated artherosclerosis

14. Dr. Suryasarthi Dasgupta, INSERM UMRS 872, Paris, France
    Investigation on the genesis of immune response to therapeutic factor VIII

15. Dr. Sanjay Banerjee, University of Pittsburgh, PA – 15206
    Genetic of cardiovascular diseases: from PRKAG2 mutations to Glycogen Storage cardiomyopathy

16. Dr. Pijush K. Das, Indian Institute of Chemical Biology, Kolkata
    Role of intacellular cAMP in resistance against macrophage oxidative damage in Leishmania donovani

THESES (Doctoral and MS)

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Devrani Mitra</td>
<td>Structure characterization of mammalian cell entry proteins and peptidyl-prolyl cis-trans isomerase A of Mycobacterium tuberculosis</td>
</tr>
<tr>
<td>2</td>
<td>Dipanjan Ghosh</td>
<td>Immunomodulatory and anti tumor effects of abrus agglutinin</td>
</tr>
<tr>
<td>3</td>
<td>Rashmi Shrivastava</td>
<td>Protein-Protein interaction of two component signal transduction proteins coded by Rv0606c, Rv0601c and Rv0602c of Mycobacterium tuberculosis</td>
</tr>
</tbody>
</table>
PATENTS GRANTED

1. Prof. P. Das, Dr. R. Sen, Mr. B. B. Ghosh, Mr. H. B. Prasad, Prof. S. Dey
   A Novel Biofuel Additive for Diesel Engines
2. Prof. D. Das
   Development of high rate and yield hydrogen production process

LAURELS & DISTINCTIONS

1. Dr. Ramkrishna Sen
   Biographical profile published in the Marquis Who’s Who in the World
2. Prof. Debabrata Das
   International Association for Hydrogen Energy (IAHE) Akria Mastusi Award
3. Dr. Ramkrishna Sen
   Travel Grant under UKIERI Programme, British Council
4. Prof. Debabrata Das
   Fellow-INAE
5. Dr. Pinaki Sar
   BOYSCAST Fellowship, DST- India

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

1. Bioinformatics in Genomics and Proteomics 2 days
2. International Conference on Biohydrogen Production Technology 3 days (IWBT-2008)
DEPARTMENT OF CHEMICAL ENGINEERING

HEAD : Professor Dibyendu Mukherjee

FACULTY

Professor :

Das Gupta, Sunando  Ph.D.(RPI, New York), Transport Phenomena, Membrane Separation
De, Sirshendu  Ph.D.(IIT Kanpur), Transport Phenomena, Membrane Separation, Heat Transfer
Mukherjee, Dibyendu  Ph.D.(IIT Kharagpur), Multiphase Flow, Modeling & Simulation
Pradhan, Narayan Chandra  Ph.D.(UDCT Bombay), Mass Transfer Operations, Petroleum Refinery Engineering, Petrochemical Technology, Reaction Engineering
Samanta, Amar Nath  Ph.D. (IIT Kharagpur), Advanced Process Control, Nonlinear Process Control

Associate Professor :

Basu, Jayanta Kumar  Ph.D.(IIT Kharagpur), Reaction Engineering, Adsorption and Separation Science, Water Pollution Control
Chakraborty, Sudipto  Ph.D.(IIT Kharagpur), CFD and Heat Transfer, Real-time Process Modeling & Simulation, Mineral Beneficiation
Das, Gargi  Ph.D.(IIT Kharagpur), Multiphase Flow, Two Phase Instrumentation, Fluid Mechanics
Ganguly, Saibal  Ph.D.(IIT Kanpur), Refinery, Petrochemicals, Polymer, Coal, Real Time Simulation & Control, Optimization
Kargupta, Kajari  Ph.D.(IIT Kanpur), Interfacial Fluid Dynamics, Thin Films, Nano-science
Kundu, Gautam  Ph.D.(IIT Kharagpur), Polymer Engineering, Fluid Dynamics, Mineral Engineering
Neogi, Sudarsan  Ph.D.(Ohio University), RF Plasma Processing, Plasma Deposition, Material Syntheses using RF Plasma, Chemical Vapor Deposition, Plasma Processing for Biomedical Application
Neogi, Swati  Ph. D.(Ohio University), Polymer Application Research, Composite manufacturing technology, Materials development, Fiber optics Cable design, Polymer fracture analysis/durability, Flame retardant materials development
Patwardhan, Anand Vinayak  Ph.D.(UDCT Mumbai), Green Technology, Mass Transfer Operations, Heterogeneous Reactions, Microchannel Reactors

Assistant Professor :

Chakrabarty, Saikat  Ph.D.(University of Houston), Chemical Reaction
Ganguly, Somenath  Ph.D.(University of Kansas), Flow through thin channel, porous medium, membrane separation, Numerical methods & use of AI based tool, Visco-elasticity & diffusion in hydrogel

Jana, Amiya Kumar  Ph.D.(IIT Kharagpur), Reactive Distillation, Control System, Modeling and Simulation

Kar, Debdulal  Ph.D.(IIT Kharagpur), Fluidization Engineering, Mineral Beneficiation

Meikap, Bhim Charan  Ph.D.(IIT Kharagpur), Industrial Pollution Control, Hazardous Waste Management and Safety, Multi-Phase Flow System, Environmental Engineering

Ray, Subhabrata  M.Tech.(IIT Kharagpur), Petroleum Refining, Process Control

Sengupta, Sonali  Ph.D.(UDCT Mumbai), Heterogeneous and homogeneous catalysis, Petroleum and petrochemicals engineering

Emeritus Professor:

Officer:
Babra, Nitosh Kumar  Dipl. Ing. (TUB, Berlin), Biomedical Engineering & Bacterial Pathogen, Bio & Nano biotechnology, Organic & Bio-chemistry in CEP, Bioleaching of Minerals

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Faculty Appointment:
Prof. Somnath Ganguly  Assistant Professor

Faculty Promotion:
Prof. Swati Neogi  Associate Professor
Prof. N. C. Pradhan  Professor
Prof. S. De  Professor

Faculty Retirement:
Prof. R. K. Saha  Professor
Prof. D. Bhattacharya  Assistant Professor

Faculty on Re-employment (Upto 65 years age):
Prof. R. K. Saha  Emeritus Professor
Facility Resignation:
Prof. Kajari Kargupta        Associate Professor

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities:

1. Heterogeneous reactions with application to chemical process development with special emphasis on greener alternatives
2. Utilisation of non-edible oils for manufacturing of value-added chemicals
3. Steam reforming of petroleum feedstock in mini-and micro-reactors for production of Hydrogen
4. Advanced separation processes involving membranes with emphasis on water purification, dye removal, effluent treatment processes etc.
5. Simulation and modeling of coal & biomass combustion processes in pulverized and fluidized combustors
7. Real-time inferencing & property prediction for polymerization reactor, blast furnace reactor etc.
8. Development of innovative catalysts from fly ash for organic chemical synthesis (alkylation, isomerisation etc.)
10. Technology of composite materials
11. Pattern Formation of Soft Materials utilizing Interfacial Instability
12. Training of Personnel for construction and maintenance of Bio Gas Plants

Thrust Areas:

1. Green chemical process technology
2. Advanced separation processes & environmental process engineering
3. Multiphase flow and reaction engineering
4. Petroleum reaction engineering & petrochemical processes
5. Real-time process control
6. CFD application in chemical processes and equipment design
7. Technology of composite materials
8. Thin Films, Interfacial and Nano Science
9. Hydrogen Production by steam reforming in micro reactor
10. Manufacture and testing of Polymer Composites

New Acquisitions:

1. Particle Size Analyzer
2. Ammonia TPD Apparatus
3. Bubble Cap Distillation Column
4. Stefan Boltzmann Apparatus
5. Spray Column Extraction Unit  
6. Pressure Drop in Pipe Fittings  
7. Hydrocyclone  
8. Flow through Nozzles  
9. Vapor-liquid Equilibrium Data Collection Cell  
10. Thermal Conductivity Measurement

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects:**

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Investigations on oil-water core-annular flow through experiments and theoretical analysis for the production and processing of heavy oils</td>
<td>IIT, Kharagpur</td>
<td>Rs.1.00 Lakh</td>
</tr>
<tr>
<td>2.</td>
<td>A study of Microscale transport processes leading to the development of a cooling strategy for electronics components</td>
<td>Department of Information Technology</td>
<td>Rs.89.76 Lakhs</td>
</tr>
<tr>
<td>3.</td>
<td>Abatement of Dust, SO2 and NOx by Wet Scrubbing Process</td>
<td>MHRD, New Delhi</td>
<td>Rs.8.00 Lakhs</td>
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<tr>
<td>4.</td>
<td>Ammonia Production By Using Urea For Flue Gas Conditioning</td>
<td>National Thermal Power Corporation (NTPC), New Delhi</td>
<td>Rs.65.00 Lakhs</td>
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<tr>
<td>5.</td>
<td>Bio Gas development &amp; training Centre</td>
<td>Ministry of New &amp; Renewable Energy, IIT Kharagpur</td>
<td>Rs.6.00 Lakhs</td>
</tr>
<tr>
<td>6.</td>
<td>CFD and experimental study of multi-phase systems (solid-liquid and gas-liquid)</td>
<td>TIFAC, DST, New Delhi</td>
<td>Rs.346.20 Lakhs</td>
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<tr>
<td>7.</td>
<td>Composite Applications Laboratory</td>
<td>MHRD, New Delhi</td>
<td>Rs.9.00 Lakhs</td>
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<tr>
<td>8.</td>
<td>Computational fluid dynamics modeling and flow visualization of a gas liquid mixture through a nozzle and subsequent spray</td>
<td>Tata Steel, Jamshedpur</td>
<td>Rs.5.00 Lakhs</td>
</tr>
<tr>
<td>9.</td>
<td>Design of bench scale unit for chemical beneficiation</td>
<td>MHRD, New Delhi</td>
<td>Rs.5.00 Lakhs</td>
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<tr>
<td>10.</td>
<td>Development of Catalysts for Petroleum Refining from Flyash</td>
<td>CSIR, New Delhi</td>
<td>Rs.8.04 Lakhs</td>
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<tr>
<td>11.</td>
<td>Development and application of ceramic foam supported catalysts in petrochemical industries</td>
<td>IIT Kharagpur</td>
<td>Rs.3.00 Lakhs</td>
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<td>12.</td>
<td>Development and characterization of a high efficiency wet scrubber with internals for air pollution control</td>
<td>Tata Steel Limited, Jamshedpur</td>
<td>Rs.11.60 Lakhs</td>
</tr>
<tr>
<td>Project Number</td>
<td>Description</td>
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<td>Amount (Lakhs)</td>
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<tr>
<td>14</td>
<td>Development of low cost household filter for arsenic and other pollutant free drinking water using modified laterite</td>
<td>DST, New Delhi</td>
<td>Rs.20.40</td>
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<tr>
<td>15</td>
<td>Development of new regeneration process with the chemical leaching circuit to upgrade high ash Indian coal</td>
<td>Tata Steel, Jamshedpur</td>
<td>Rs.13.00</td>
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<tr>
<td>16</td>
<td>Development of optimally controlled drug release device using multilayered electroactive nanoploymers</td>
<td>DBT, New Delhi</td>
<td>Rs.28.60</td>
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<tr>
<td>17</td>
<td>Development of sensors for gas-liquid and liquid-liquid two phase flow</td>
<td>MHRD, New Delhi</td>
<td>Rs.14.00</td>
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<tr>
<td>18</td>
<td>Flow visualization and theoretical prediction of transition criteria during up flow of liquid-liquid and gas-liquid-liquid mixtures through Vertical a</td>
<td>DST, New Delhi</td>
<td>Rs.7.32</td>
</tr>
<tr>
<td>19</td>
<td>Flux enhancement and fouling reduction during effluent (leather &amp; dye) treatment using membrane separation</td>
<td>DST, New Delhi</td>
<td>Rs.22.00</td>
</tr>
<tr>
<td>20</td>
<td>Formation of ordered meso patterns using interfacial instability and dewetting polymers</td>
<td>DST, New Delhi</td>
<td>Rs.20.00</td>
</tr>
<tr>
<td>21</td>
<td>Hydrodynamic study of Vortex and air-core formation in a two phase flow for simple geometries</td>
<td>Tata Steel, Jamshedpur</td>
<td>Rs.2.20</td>
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<tr>
<td>22</td>
<td>Hydrodynamics Studies on Micro Bubble Generators</td>
<td>Tata Steel, Jamshedpur</td>
<td>Rs.4.62</td>
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<tr>
<td>23</td>
<td>Micellar enhanced ultrafiltration for removal of organic and inorganic pollutants from aqueous streams</td>
<td>DST, New Delhi</td>
<td>Rs.10.00</td>
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<tr>
<td>24</td>
<td>Nonlinear State Estimation and Control of a Reactor for Heterogeneous Reaction</td>
<td>IIT, Kharagpur</td>
<td>-</td>
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<tr>
<td>25</td>
<td>Performance Evaluation of Bag Filters in the Sponge Iron Plants in Orissa-Field Investigation</td>
<td>Min. of Environment &amp; Forest, Govt. of Orissa</td>
<td>Rs.32.00</td>
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<td>26</td>
<td>Performance study of a hydrocyclone</td>
<td>Tata Steel, Jamshedpur</td>
<td>Rs.8.00</td>
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<tr>
<td>27</td>
<td>Process development and engineering analysis of greener routes for commercially important organic diisocyanates, and epoxidised non-edible oils</td>
<td>IIT Kharagpur</td>
<td>Rs.3.00</td>
</tr>
<tr>
<td>28</td>
<td>Removal of Toxic Dyes from Industrial Effluent using a Copmbination of Adsorption and Membrane Separation Process</td>
<td>MHRD, New Delhi</td>
<td>Rs.8.00</td>
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<tr>
<td>29</td>
<td>Steel Technology Centre</td>
<td>DST, New Delhi</td>
<td>Rs.2025.00</td>
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<tr>
<td>30</td>
<td>Studies in Reforming of Methane to Syn Gas in Mini &amp; Micro-reactor for Production of Hydrogen</td>
<td>Min. of Chemical &amp; Fertilizer, New Delhi</td>
<td>Rs.50.00</td>
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<td>31</td>
<td>Studies on Effective Use of Microwave</td>
<td>CSIR, New Delhi</td>
<td>Rs.13.30</td>
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</tbody>
</table>
### Energy for Green Mineral Beneficiation and Pipe Line Slurry Transport

32. Studies on in-situ Reaction and Separation of Steam Reforming Product Mixtures in Membrane Reactor  
   Min. of Chemicals & Fertilizer, New Delhi  
   Rs.71.53 Lakhs

33. Surfactant based separation processes for the treatment of industrial effluent  
   MHRD, New Delhi  
   Rs.13.00 Lakhs

34. Synthesis & Characterization of Semiconducting Polymers  
   IIT, Khagagpur  
   Rs.3.00 Lakhs

35. Synthesis & Engineering of Advanced Materials Using RF Plasma for Chemical, Microelectronic, Biochemical and Biomedical Applications  
   DST, New Delhi  
   Rs.58.13 Lakhs

36. Utilization of Hydrogen Sulphide for the Production of Value-Added Chemicals  
   CSIR, New Delhi  
   Rs.11.96 Lakhs

37. Water lubricated transport of heavy oils – experimentation and theory  
   DST, New Delhi  
   Rs.19.00 Lakhs

### Consultancy Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Behavior of coating on optical fiber performance</td>
<td>Sterlite Optical Technologies</td>
<td>Rs.0.30 Lakhs</td>
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<tr>
<td>2.</td>
<td>Consultancy input for Data Acquisition and Control at Tata Steel</td>
<td>Tata Steel</td>
<td>Rs.2.00 Lakhs</td>
</tr>
<tr>
<td>3.</td>
<td>Consultancy Input for design and optimization &amp; evaluation of Technoeconomics</td>
<td>Tata Steel, Jamshedpur</td>
<td>Rs.9.17 Lakhs</td>
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<tr>
<td>4.</td>
<td>Consultancy Input for design of operator station with structured database for pilot unit</td>
<td>Tata Steel, Jamshedpur</td>
<td>Rs.6.25 Lakhs</td>
</tr>
<tr>
<td>5.</td>
<td>Consultancy input for upgradation of Indian Coal at Tata Steel</td>
<td>Tata Steel</td>
<td>Rs.9.00 Lakhs</td>
</tr>
<tr>
<td>6.</td>
<td>Consultancy Input on Design and Hydrodynamics Studies of Micro Bubble Generator</td>
<td>Tata Steel, Jamshedpur</td>
<td>Rs.2.50 Lakhs</td>
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<td>7.</td>
<td>Design and development of a mathematical model for ultra fast cooling of steel strips</td>
<td>Tata Steel, Jamshedpur</td>
<td>Rs.5.61 Lakhs</td>
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<tr>
<td>8.</td>
<td>Design of an industrial scale hydrocyclone</td>
<td>Tata Steel, Jamshedpur</td>
<td>Rs.6.56 Lakhs</td>
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<tr>
<td>9.</td>
<td>Design of bubble column with external bubble generator</td>
<td>Tata Steel, Jamshedpur</td>
<td>Rs.6.00 Lakhs</td>
</tr>
<tr>
<td>10.</td>
<td>Design Verification of Bag Filters installed at various Sponge Iron Plants in Orissa</td>
<td>State Pollution Control Board, Orissa, Bhubaneswar</td>
<td>Rs.11.82 Lakhs</td>
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<tr>
<td>11.</td>
<td>Development of mixing model for alloy dissolution in steel ladles</td>
<td>Tata Steel, Jamshedpur</td>
<td>Rs.4.00 Lakhs</td>
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<tr>
<td>12.</td>
<td>Development Of Software For Design Of</td>
<td>TISCO, Jamshedpur</td>
<td>Rs.2.12 Lakhs</td>
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</table>
Two Phase Flow System With Simple Geometries

13. Development of Synthetic Resins  Suparna Chemicals Limited, Mumbai  Rs.4.00 Lakhs
14. Exploratory Work on Dry Beneficiation of Iron Ore and Coal Fines  Tata Steel  Rs.2.97 Lakhs
15. Lime Calcination project at TISCO  TISCO  Rs.2.00 Lakhs
16. Optical fiber cable design & process  Sterlite Optical Fiber Technologies Ltd.  Rs.0.30 Lakhs
17. Real Time Simulator and expert GUI for Blast Furnaces  NML Jamshedpur  Rs.40.00 Lakhs
18. Scoping Study for development of Chemical Leaching pilot plant for Tata Steel  Tata Steel Jamshedpur  Rs.3.00 Lakhs
19. Technical Support and guidance to Improve Quality of Lead Acid Battery  Bright Solar  Rs.0.25 Lakhs

VISITS ABROAD BY FACULTY MEMBER

1. Mr. Nitosh Kumar Brahma  
   To present papers entitled PPP-C and IT, BT and NT in Social reform (University Vrijee, Amsterdam and University Granada, Spain), 14 days
2. Dr. Sonali Sengupta  
   Visiting Professor (Lunghuya University of Science and Technology, Taiwan and Vanung University of Technology, Taiwan), 7 days
3. Prof. Narayan Chandra Pradhan  
   Collaborative research as Visiting Scientist (University of Saskatchewan, Saskatoon, Canada), July 2 - December 24, 2007

INVITED LECTURES BY FACULTY MEMBERS

1. Dr. Sudipto Chakraborty  
   Heat transfer augmentation using nano-fluid (National Workshop on modeling of fluids – macro to nano scale, IIT Kharagpur)
2. Mr. Nitosh Kumar Brahma  
   MBT (Microbial Biotechnology); EBT (Environmental Biotechnology), MBPT (Microbial Bioprocess) and CPT (Institute of genetic Engineering, Badu, Kolkata-700128)
3. Dr. Bhim Charan Meikap  
   Abatement of Hazardous Gaseous Pollutants in a Multi-Stage Fluidized Bed Reactor (National Institute of Technology, Rourkela)
4. Prof. Sirshendu De  
   Desalination (IIT, Guwahati)
5. Prof. Sirshendu De  
   Industrial Applications of Membrane Separation Processes (IIT, Guwahati)
6. Prof. Sunando Das Gupta  
   Membrane Surface Modification using Plasma Treatment (2007) (IIT, Guwahati)
7. Prof. Sunando Das Gupta  
   Flux Enhancement Techniques in Membrane
LECTURE BY VISITING EXPERT

1. Mr. Partha S. Deb, VP, Reliance Industries Ltd., Mumbai
   Oil-refining Technology & Oil-refining Scenario in India

2. Dr. Dibakar Das, PDF, University of Cincinnati, USA.
   Synthesis and Characterization of Diamond Thin Film for High Performance Electronics Applications

3. Prof. Vishwas G. Pangarkar, Professor, Department of Chemical Engineering, UICT, University of Bombay, Mumbai
   Academic as an Industrial Consultant

4. Prof. Jerry Y. S. Lin, Chairman & Professor, Department of Chemical Engineering, Arizona State University, Tempe, USA
   Microporous Inorganic Membranes for Gas Separation by

5. Dr. Ujjwal K. Ghosh, RE, CRC for Greenhouse Gas Technologies, The University of Melbourne, Victoria, Australia
   Carbon Capture and Storage in Australia – an Overview

6. Dr. Rabibrata Mukherjee, Scientist ‘C’, CGCRI, Kolkata
   Instability, Self-Organization and Patterning of Thin Polymer Films

THESES (Doctoral and MS)

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sunil Kumar Maity</td>
<td>Multiphase Reactions (Utilization of Hydrogen Sulfide for the Production of Value-added Chemicals)</td>
</tr>
<tr>
<td>2</td>
<td>Vaibhav Vasant Goud</td>
<td>Heterogeneous Reactions (Epoxidation of Non-edible Vegetable Oils: Development of Value-added Products from Renewable Natural Sources)</td>
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<td>3</td>
<td>Ujjwal Ghosh</td>
<td>Studies on Membrane Pervaporation: Separation of Organics from Aquous Solutions and Intensification of Chemical Reactions</td>
</tr>
<tr>
<td>4</td>
<td>Rajaram Vijayan</td>
<td>Studies in Synthesis and Characterisation of Ceramic Membranes for Hydrogen Separation</td>
</tr>
</tbody>
</table>

PATENTS GRANTED

1. Dr. Bhim C. Meikap
   A Modified Multi-Stage Bubble Column for Versatile, High Efficiency Gas-liquid /Gas-Liquid-Solid contacting

2. Prof. Narayan C. Pradhan
   A Process for the Manufacture of Polyurethaneurea
3. Prof. Sirshendu De  Process for recovery of inorganic chemicals from kraft black liquor

LAURELS & DISTINCTIONS

1. Prof. Sirshendu De  Dr. A. V. Rama Rao Foundations’s award, IIChE
2. Dr. Bhim Charan Meikap  GE Ecomagination Award-2007 for Best M. Tech. Thesis and Research
3. Dr. Gautam Kundu  IIME Best Paper Published Award on Beneficiation

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

DEPARTMENT OF CHEMISTRY

HEAD: Professor Amit Basak

FACULTY

Professor:

Basak, Amit  Ph.D.(Calcutta), D.Phil.(Oxon), Organic / Bioorganic Chemistry
Bhattacharjee, Manish Ph.D.(NEHU), Inorganic Chemistry, Organometallic Chemistry
Chattaraj, Pratim Kumar Ph.D.(IIT Bombay), Theoretical Chemistry, Quantum Chaos, Quantum Toxicology
Mal, Dipak Ranjan Ph.D.(Missouri), Organic Chemistry
Pathak, Tanmaya Ph.D.(Uppsala, Sweden), Bioorganic Chemistry
Pal, Tarasankar Ph.D.(Burdwan University), D.Sc. (Viswabharati University), Inorganic Chemistry
Ray, Debashis Ph.D.(Jadavpur University), Synthetic Inorganic Chemistry, Metallacrown complexes, Magnetically coupled metal complexes.
Ray, Jayanta Kumar Ph.D.(Calcutta University), Synthetic Organic Chemistry
Roy, Sujit Ph.D.(Kanpur), Homogeneous Catalysis, Organometallic Chemistry
Sarkar, Tarun Kumar Ph.D.(Calcutta University), Organic chemistry, Organometallic chemistry
Srivastava, Suneel Kumar Ph.D.(IIT Kharagpur), Solid State Chemistry

Associate Professor:

Bandyopadhyay, Sanjoy Ph.D.(IISc., Bangalore), Theoretical and Computational Chemistry, Computational Biophysics, Molecular Modeling
Das Gupta, Swagata Ph.D.(RPI New York), Protein Chemistry, Biophysical Chemistry, Protein Structure Analysis
Dey, Joykrishna Ph.D.(IIT Kanpur), Physical Chemistry
Hajra, Saumen Ph.D.(Pune University), Synthetic Organic Chemistry
Maiti, Mrinal Mohan Ph.D.(IIT Kharagpur), Polymer Chemistry
Sarkar, Nilmoni Ph.D.(Jadavpur University), Physical Chemistry
Taraphder, Srabani Ph.D.(IISc., Bangalore), Theoretical Physical Chemistry, Statistical Mechanics

Assistant Professor:

Biradha, Kumar Ph.D.(Hyderabad), Structural Chemistry
Halder, Mintu  Ph.D.(IACS), Ultra Fast Spectroscopy, Spin Chemistry, Biophysics, Chemical Education
Mahanty (Pathak), Amita  Ph.D.(IIT Kharagpur), Nanomaterials : Synthesis & Characterization, Solid State Chemistry
Mani, G  Ph.D (IISc., Bangalore), Synthetic Inorganic Catalysis and Nanomaterials
Milton, Marilyn Daisy  Ph.D. (Delhi), Organometallic Chemistry, Synthetic Organic chemistry, Homogeneous Catalysis
Nag, Ahindra  Ph.D.(Jadavpur University), Bioorganic Chemistry
Nanda, Samik  Ph.D.(IICT, Hyderabad), Organic Chemistry
Singh, Pradeep N.D.  Ph.D.(Madras University), Organic Photochemistry
Raj, C Retna  Ph.D.(Madurai Kamaraj University), Biosensor, Nanomaterials, Electroanalytical Chemistry

Visiting Assistant Professor :
Dhara, Dibakar  Ph.D. (Osmania University), Polymer, Physical Chemistry
Rajakumar, A.  Ph.D., Environmental Analytical Chemistry

RESEARCH AND DEVELOPMENT

Brief descriptions 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 such as Brucker-Nonius MACH-3 Single Crystal X-ray Diffractometer, A Bruker AC 400 NMR Spectrometer, Bruker AC 400 NMR Spectrometer, Shimadzu DT-40 model 883 IR Spectrometer, PW-1729/1710 X-Ray Diffractometer, Cyclic Voltammeter Model P9001, Chrompack Gas Chromatograph and JASCODIP 30 digital polarimeter, Spex Fluorolog 3 fluorimeter, and a Perkin Elmer C240 CHN Analyzer. Active research in synthetic organic and inorganic chemistry is underway on the design and synthesis of novel enediynes as DNA cleaving agents, on the total synthesis of bioactive natural products such as anthracyclines, angucyclines, furocomarines, indole alkaloids, furoterpenses, 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 these awareness 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. In the field of bioinorganic chemistry, research is being pursued on electron transfer processes with emphasis in dioxygen chemistry. Department’s research interest also cover helical coordination by covalent organic strands via self-assembly allowing incorporation of cations and anions in a variety of coordination modes within 3 d metal clusters. Work on metallamacrocycles has generated significant scope for self-assembly and control of magnetic exchange phenomena. Active research is also underway in the areas of crystal engineering and development of metal nanoparticles, nanocrystalline
ferrites, ceramics and composites. Materials for high temperature and superconducting applications and solar energy conversion are also underway. Catalysis involving photoactivation techniques and micelle stabilized nanoparticles are currently being investigated to solve environmental pollution related problems. Investigation 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. Transition metal spin cluster complexes
2. Ligand design and formation and hydrolysis of imidazolidine and iminodioxocin rings
3. Drug design.

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects:**

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Role of water in predicting the protein folding-unfolding pathways: Computer simulation studies</td>
<td>DST, New Delhi</td>
<td>-</td>
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<tr>
<td>2</td>
<td>Synthetic Approaches to Nine-member Enediyne</td>
<td>CSIR, New Delhi</td>
<td>Rs. 10.00 Lakhs</td>
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<td>3</td>
<td>Use of Kinugasa Reaction for the Synthesis of Heterocycle-Enediyne Chimera</td>
<td>DST, New Delhi</td>
<td>Rs. 37.00 Lakhs</td>
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<td>4</td>
<td>Hyperthermia on Enediynes</td>
<td>DBT, New Delhi</td>
<td>Rs. 36.00 Lakhs</td>
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<td>5</td>
<td>Isolation of phosphatase from Mycobacterium and development of inhibitors</td>
<td>DBT, New Delhi</td>
<td>Rs. 300.00 Lakhs</td>
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<td>6</td>
<td>A conceptual DFT approach towards metal toxicity</td>
<td>BRNS, Mumbai</td>
<td>Rs. 7.00 Lakhs</td>
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<td>7</td>
<td>Assessment of biological activity and toxicity: An in Silico investigation based on the combined quantum mechanics and molecular Silico investigation based on the combined quantum mechanics and molecular dynamics study</td>
<td>CSIR, New Delhi</td>
<td>Rs. 12.00 Lakhs</td>
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<td>8</td>
<td>Enantioseparation of Drugs and Small</td>
<td>CSIR, New Delhi</td>
<td>Rs. 7.50 Lakhs</td>
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<td>No.</td>
<td>Title</td>
<td>Institution</td>
<td>Funding (Lakhs)</td>
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<td>9.</td>
<td>Interactions Between Water-Soluble Hydrophobically Modified Polymers and Surfactants: Rheology, Fluorescence Probe, and Calorimetric Studies</td>
<td>BRNS, DAE, Mumbai</td>
<td>14.90</td>
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<tr>
<td>11.</td>
<td>Spin-Chemistry of photo-generated Radical-pairs in Room Temperature Ionic Liquids (RTILs) and in organized molecular assemblies: Studies on some mo</td>
<td>CSIR, New Delhi</td>
<td>10.00</td>
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<tr>
<td>12.</td>
<td>Magnetic Field Effect on Radical-pair Recombination in Chemical and Biochemical Systems: An Optical Spectroscopic Study</td>
<td>DST, New Delhi</td>
<td>15.70</td>
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<td>15.</td>
<td>Total Synthesis of Chrymutasins</td>
<td>DST, New Delhi</td>
<td>23.00</td>
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<td>16.</td>
<td>Processing and Performance of Biodiesel</td>
<td>DST, New Delhi</td>
<td>19.00</td>
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<td>17.</td>
<td>Recycling Of Plastics</td>
<td>IIT Kharagpur</td>
<td>-</td>
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<tr>
<td>18.</td>
<td>Production of Lipase and its application</td>
<td>DBT, New Delhi</td>
<td>25.00</td>
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<td>19.</td>
<td>Mono-, Di- and Bisvinyl Sulfone-Modified Carbohydrates as Versatile Synthons: A New “Chiron Approach” to Heterocycles, Carbocycles, Sugar Cluster</td>
<td>DST, New Delhi</td>
<td>21.72</td>
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<td>20.</td>
<td>Synthesis and Biological Studies of Azido and Aminohexopyranosyl Nucleosides and Aminohexopyranose Containing Oligomers: Towards New Classes of Antivi</td>
<td>Indo–French Centre for the Promotion of Advanced Research</td>
<td>35.00</td>
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<tr>
<td>21.</td>
<td>Characterization of Micelles, Reverse Micelles in Room temperature ionic liquids (RTILs) using Dynamic Light Scattering, Fluorescence Spectroscopy</td>
<td>DST, New Delhi</td>
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<td>22.</td>
<td>Study of ultrafast processes in ionic liquid containing micro heterogeneous media</td>
<td>CSIR, New Delhi</td>
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<td>23.</td>
<td>Photoinduced electron and energy</td>
<td>DST, New Delhi</td>
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transfer of some organic molecules in biologically relevant organized media

24. Spectroscopic Study of Solvation dynamics and Photochemical reactions in solution and organized assemblies
   CSIR, New Delhi  Rs. 6.36 Lakhs

25. Epoxy-reinforced inorganic material filled organic polymer composites in tribological applications
   DRDO, New Delhi  Rs. 24.60 Lakhs

26. Development and characterization of semiconducting nano tubes and nanorods for thermoelectric applications
   DST, New Delhi  Rs. 17.00 Lakhs

27. Development and characterization of nanofillers in polymer composites
   MHRD, New Delhi  Rs. 20.00 Lakhs

28. Simulation and fabrication of a CVD/CVI set up for Ceramic Matrix Composites in general and SiC reinforced Graphite Matrix composites in particular
   DRDO, New Delhi  Rs. 13.60 Lakhs

29. Development and characterization of semiconducting thin films of layer transition metal dichalcogenides
   -  Rs. 10.46 Lakhs

30. Investigations on development and characterization of new layer type ternary and quaternary chalcogenides with ZnIn2S4 IIIa and a FeGa2S4 structures
   CSIR, New Delhi  Rs. 8.68 Lakhs

31. Development and characterization of organic polymer-inorganic materials nanocomposites
   CSIR, New Delhi  Rs. 6.60 Lakhs

32. Theoretical Modelling of the Role of Hydration in Proton Transfer Processes
    CSIR, New Delhi  Rs. 9.51 Lakhs

33. Generation & reactivity of bimetallic tin-transition metal complexes
    CSIR, New Delhi  Rs. 3.00 Lakhs

34. Cooperative Bimetallic Catalysis
    DST, New Delhi  Rs. 31.00 Lakhs

35. Physico-Chemical Characterization of Metal Based Drugs
    DST, New Delhi  Rs. 20.00 Lakhs

36. Design, Synthesis and characterization of lipophilic polyelectrolyte gels
    DST, New Delhi  Rs. 17.00 Lakhs

37. Electrophoresis of polyethylene glycol copolymers
    IIT Kharagpur  Rs.1.00 Lakhs

38. Combinatorial biocatalysis: Generation of compound libraries based on small molecule scaffold, taking the lead from nature
    DST, New Delhi  Rs.20.00 Lkhs

39. Screening for hydroxynitrile lyase from cyanogenic plant species in Indian subcontinent: their application in asymmetric organic synthesis
    IFS, Sweden, DBT, New Delhi  Rs.15.00 Lakhs
VISITS ABROAD BY FACULTY MEMBER

1. Prof. T. Pathak
   National Tsing Hua University, Hsinchu, Taiwan (3 days),
   Purpose : 1st India-Taiwan Conference on Frontiers of Organic Chemistry.

2. Prof. T. Pathak
   University of Grenoble, France (One month),
   Purpose : Visiting scientist (sponsored by Indo-French Centre for the Promotion of Advanced Research).

3. Prof. Amit Basak
   Russian Chemical Society, Moscow (Sept-24 - Sept' 27),
   Purpose : As an invited speaker in INDO-Russian symposium

INVITED LECTURES BY FACULTY MEMBERS

1. Prof. Sanjoy Bandyopadhyay
   Indo-German Conference on Modeling Chemical and Biological Reactivity, Indian Institute of Chemical Technology, Hyderabad, India

2. Prof. Sanjoy Bandyopadhyay
   Workshop on Structure and Dynamics of Biomolecules 2007, S. N. Bose National Centre for Basic Sciences, Kolkata, India

3. Prof. Amit Basak
   Radical Mediated DNA cleavage, IIT Kanpur (Invited Lecture)

4. Prof. Amit Basak
   A Radical Approach to Anticancer Agents, Bethune College, Kolkata (Speaker)

5. Prof. Amit Basak
   Chemistry of Enediynes, Bankura Sammilani College (Speaker)

6. Prof. Amit Basak
   Foundations of Chemistry, Govt. V. Y. T. P. G Autonomous College, Durg, Chattisgarh (IAS, INSA and NAS sponsored Workshop (Resource Person)

7. Prof. Amit Basak
   Chemistry and Biology of Radicals, Burdwan University (Speaker)

8. Prof. P. K. Chattaraj
   National Seminar programme on, “Frontiers in Chemistry – V”, Department of Chemistry, University of North Bengal, March 2008 (Lecture on 'Conceptual DFT and Chem. Reactivity')

9. Prof. P. K. Chattaraj
   National Symposium on, “Quantum Chemistry, Soft Computing & Optimization”, Indian Association for the Cultivation of
10. Prof. P. K. Chattaraj
Science (IACS), April 2008 (Lecture on 'Reactivity, Aromaticity and Toxicity')


11. Prof. P. K. Chattaraj
Indo- German Conference on, Modeling Chemical and Biological (Re)activity, IICT, Hyderabad, September, 2007 (Member,Sci. Adv. Comm. & Lecture on 'Quant. Traj.')

12. Prof. P. K. Chattaraj
International Conference on “Recent Developments in Non-linear Dynamics, School of Physics, Bharathidasan University, Tiruchirapalli, February 2008 (Lecture on 'Quantum Trajectory')

13. Prof. P. K. Chattaraj
IAS (Bangalore), INSA (New Delhi) and NAS (Allahabad) Sponsored workshop on 'Concepts in Chemistry', Ramananda College, Bishnupur, September, 2007 (Resource Person and lecture on 'Chem. Reactivity')

14. Prof. P. K. Chattaraj
Refresher Course in Chemistry for College and University Teachers, Science College, Calcutta University (Lecture on 'Conceptual DFT and Chem. Reactivity')

15. Prof. P. K. Chattaraj
National Conference on Windows of Chemistry, Bankura Sammilani College, West Bengal, February, 2008 (Chairman, tech. session; lecture on 'Chem. React.')

16. Prof. P. K. Chattaraj
Organised: National workshop on 'Physics of warped extra dimensions', IIT Kharagpur, February 2008 (Welcome address)

17. Prof. P. K. Chattaraj
Organised: IAS (Bangalore), INSA (New Delhi) and NAS (Allahabad) sponsored workshop on 'Foundations of Chemistry', Govt. V. Y. T. P. G. Autonomous College, Durg, Chhattisgarh, March 2008 (Organizer & Resource Person)

18. Prof. D. R. Mal
Tandem annulation strategy for convergent synthesis of benzonaphthopyranones: total synthesis of at Indian Institute of Technology (one hour)

19. Prof. T. Pathak
1st India-taiwan Conference on Frontiers of Organic Chemistry, National Tsing Hua University, Hsinchu, Taiwan

20. Prof. T. Pathak
Vinyl Sulfone-modified Carbohydrates: An Unexplored Group of Chiral Building Blocks. at Departement of Molecular Pharmacochemistry, CNRS / Universite Joseph Fourier-Grenoble I, France
21. Prof. T. Pathak  
   Synthetic Modification of Carbohydrates and Nucleosides. at Department of Chemistry, Universite Claude Bernard Lyon 1, France

22. Prof. T. Pathak  
   Vinyl Sulfone-modified Carbohydrates: An Unexplored Group of Chiral Building Blocks. at Organic Chemistry (Synthesis) Department, NCL, Pune

23. Prof. D. Ray  
   Winter School in Bioinorganic Chemistry, Indian Institute of Technology, Bombay, November 17-30, 2007 (Invited)

24. Prof. D. Ray  
   UGC sponsored refresher course on perspectives in chemistry, Jadavpur University (Invited Speaker and Resource Person)

25. Prof. D. Ray  
   A journey from mononuclear to tetruclear complexes of cobalt at Department of Chemistry, Indian Institute of Technology, Kanpur, August 16, 2007

26. Prof. D. Ray  
   Nickel in biomimetic structural model, metallacrown, metallacubane, and spin-coupled cluster at Indian Institute of Technology, Guwahati

27. Prof. Nilmoni Sarkar  
   Chemical Research Society Kolkata Chapter meeting, Jadavpur university, Kolkata, August 02, 2007

28. Prof. Nilmoni Sarkar  
   International Congress on Ionic Liquids (COIL-2), Yokohama, Japan, 2-5 August 2-5, 2007 (Invited lecture)

29. Prof. S. Taraphder  
   4th IFLASC meeting of the Joint Indo-French Laboratory, Indian Institute of Science, Bangalore (Invited Speaker)

30. Prof. S. Taraphder  
   Workshop on Structure & Dynamics of Biomolecules-2007, S.N. Bose National Centre for Basic Sciences, Kolkata (Invited Lectures)

THESES (Doctoral and MS)

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Indrajit Das</td>
<td>Synthesis and Synthetic Applications of Endocyclic and Exocyclic Vinyl Sulfone-Modified Furanosides</td>
</tr>
<tr>
<td>3.</td>
<td>Jyoti R. Ota</td>
<td>One dimensional nanostructures of some group V-VI semiconductors: Synthesis, characterization and coating with conducting polymers</td>
</tr>
<tr>
<td>4.</td>
<td>Poloumi Roy</td>
<td>Development and characterization of some important nanodimensional semiconducting metal chalcogenides</td>
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</table>
5. Himadari Acharya  Development and characterization of some polyolefinic nanocomposites
6. Bidyut Senapati  Anionic [4 + 2] cycloaddition in the synthesis of carbazoles and synthetic studies towards furanosteroids
7. Pallab Pahari  Studies on the synthesis of selected isobenzofuranone and angucyclinone natural products
8. Surajit Some  Synthetic Studies Toward Substituted Benezene, Quinoline Indoloquinoline Derivatives from Bromovinylaldehydes and Steroselective Synthesis of Tricyclic Thiophene Derivatives
9. Sasmita Mohapatra  Synthese and Characterizations of Functionalized Iron Oxide Nanoparticles for Biological Applications
10. Soumen Basu  Studies of Interparticles Interaction with and without Metal Nanoparticles in Different Solvents
12. Sohaham Dasgupta  Studies on the Coordination Chemistry of Iron (III) and Copper (II) with Modified SALEN and Amino Acid Ligands
13. Bikash Kumar Jena  Synthesis and Characterization of Nanostructured Metal Particles for Electrocatalytic and Bioelectrocatalytic
14. Ujjal Kanti Roy  Tuning the Reactivity of Tin(II) by Transition Metal Catalysts: An Organometallic Approach

BOOK PUBLISHED

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the Author(s)</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Mr. D. Seth and Dr. N. Sarkar</td>
<td>Dynamics of Solvent and Rotational Relaxation of</td>
<td>Taylor and Francis / CRC Press</td>
<td>2008</td>
</tr>
</tbody>
</table>
Room Temperature Ionic Liquids (RTILs) in RTILs Containing Microemulsions in Review Book: Microemulsions: Properties and Applications

5. Dr. D. Dhara Polymers for Biomedical Applications, Second Edition

PATENTS GRANTED

1. Dr. D. Dhara Radiation stable aromatic carbonate polymer compositions US Patent 7,374,718
2. Dr. D. Dhara Electrically conductive compositions and method of manufacture thereof US Patent 7,354,988

LAURELS & DISTINCTIONS

1. Prof. Amit Basak Orissa Chemical Society Award, 2007
2. Prof. Amit Basak Council Member, NOST, 2007
3. Prof. Amit Basak Member, Program Advisory Committee DST (organic), 2007
4. Prof. P. K. Chattaraj Elected to the Fellowship of the Indian National Science Academy, New Delhi, 2008
5. Prof. P. K. Chattaraj Elected Council Member, Chemical Research Society of India, 2008
6. Prof. P. K. Chattaraj Member, Editorial Board: Journal of Chemical Sciences, Bangalore, 2008
13. **Prof. P. K. Chattaraj**  

14. **Prof. P. K. Chattaraj**  

15. **Prof. P. K. Chattaraj**  

16. **Prof. P. K. Chattaraj**  
UGC (Dr. D. S. Kothari Postdoctoral Fellowship, Application); World Scientific Publishing, McGraw-Hill Education (Book Proposal), 2008

17. **Prof. P. K. Chattaraj**  
CSIR, DST, BRNS (Project Proposals) etc., 2008

18. **Prof. P. K. Chattaraj**  

19. **Prof. Debashis Ray**  
Bronze Medal of Chemical Research Society of India (CRSI), 2008.

20. **Dr. Nilmoni Sarakr**  

21. **Prof. Sujit Roy**  
Fellow, Indian Academy of Sciences, 2008
DEPARTMENT OF CIVIL ENGINEERING

HEAD :  Professor Shambhu Pada Das Gupta

FACULTY

Professor :

Bandyopadhyay, Janendra Nath
Ph.D.(IIT Kharagpur), Structural Engineering

Bhattacharyya, Sriman Kumar
Ph.D.(IIT Kharagpur), Structural Health Monitoring, Structural Engineering, Fluid-structure Interactions, Restoration of Structures

Das Gupta, Shambhu Pada
Ph.D.(IIT Kanpur), Geotechnical Engineering

Dey, Subhasish
Ph.D.(IIT Kharagpur), Hydromechanics

Ghosh, Deba Prasad
Ph.D.(IIT Kharagpur), Geotechnical Engineering

Ramachandra, Lingadahally
Ph.D.(IIT Madras), Structural Engineering

Reddy, Kusam Sudhakar
Ph.D.(IIT Kharagpur), Transportation Engineering

Associate Professor :

Baidya, Dilip Kumar
Ph.D.(IISc Bangalore), Geotechnical Engineering

Barai, Sudhir Kumar
Ph.D.(IISc Bangalore), Structural Engineering

Bhattacharya, Baidurya
Ph.D. (Johns Hopkins University), Fracture and damage mechanics, Stochastic methods, Probability based design, Nanomechanics, Atomistic simulations

Desai, Venkappayya R
Ph.D.(Clemson University), Water Resources Engineering & Management

Dhang, Nirjhar
Ph.D.(IIT Kharagpur), Structural Engineering, Biomechanics

Ghangrekar, Makarand Madha

Gupta, Ashok Kumar
Ph.D.(IIT Bombay), Environmental Engineering

Maitra, Bhargab
Ph.D.(IIT Bombay), Transportation Planning & Traffic Engineering

Maity, Damodar
Ph.D.(IIT Kharagpur), Structural Engineering

Sen, Dhrubajyoti
Ph.D.(IIT Delhi), Water Resources Engineering

Assistant Professor :

Chakraborty, Sushanta
Ph.D.(IIT Kharagpur), Structural Engineering

Goel, Sudha
Ph.D.(Johns Hopkins University), Environmental Engineering

Pal, Anjali
Ph.D. (Calcutta University), Nanoscience and Nanotechnology, Environmental Science and Engineering, Analytical Spectroscopy
Roy, Debasis  
Ph.D(University of British Colombia), Geotechnical Engineering
Sen Gupta, Aniruddha  
Ph.D.(Illinois University), Geotechnical Engineering, Earthquake Engineering
Reddy, M. Amaranatha  
Ph.D. (IIT Kharagpur), Transportation Engineering

**Lecturer:**

Hussain, S. J.  
Ph.D. (IIT, Kharagpur), Structural Engineering
Verma, S.  
Ph.D. (IIT, Bombay), Environmental Engineering

**FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION**

Faculty on Re-employment (Upto 70 years age):

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof. B. B. Pandey</td>
<td>Professor</td>
</tr>
<tr>
<td>Prof. S. Majumdar</td>
<td>Visiting Professor</td>
</tr>
</tbody>
</table>

**RESEARCH AND DEVELOPMENT**

**Brief descriptions of on-going activities:**

1. **EnE**: 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; Photo degradation 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.

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

3. **HWRE**: Investigations of effect of lateral flow on turbulent submerged jets, Study of coherent 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.

4. **GTE**: Landslides and slope stabilization, Geotechnical Earthquake engineering, and Shallow and deep foundations

Thrust Areas:

1. **EnE**: Water and Wastewater treatment, Solid Waste Engineering, Environmental Microbiology, Environmental Impact Assessment, Air Pollution Modeling, Bioenergy.
4. **GTE**: Geotechnical Earthquake Engineering, Rock Slope Stability, Ground Improvement with Natural additives and Foundation Strengthening of Monumental Structures.

New Acquisitions:

1. Dynamic Shear Rheometer
2. Cyclic Simple Shear Apparatus

ON-GOING RESEARCH PROJECTS

Sponsored Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A study on The Effects of Layering on The Dynamic Response of Foundations</td>
<td>CSIR, New Delhi</td>
<td>Rs. 8.50 Lakhs</td>
</tr>
<tr>
<td>2.</td>
<td>Bridge scour estimation, measurement and protection and use of various time systems like TDR, TTS and SA</td>
<td>RDSO</td>
<td>Rs. 151.00 Lakhs</td>
</tr>
<tr>
<td>3.</td>
<td>Coupled sloshing Response in a stiffened composite container</td>
<td>AR&amp;DB</td>
<td>Rs. 5.17 Lakhs</td>
</tr>
<tr>
<td>4.</td>
<td>Design of Stilling Basin under variable hydraulic conditions</td>
<td>Ministry of Water Resources, New Delhi</td>
<td>Rs. 19.50 Lakhs</td>
</tr>
<tr>
<td>5.</td>
<td>Development of durable, water-repellent jute geotextiles</td>
<td>Jute Manufacturer's Development Council</td>
<td>Rs. 168.72 Lakhs</td>
</tr>
<tr>
<td>6.</td>
<td>Development of Low-cost Technology for Arsenic Removal and an Easy to Detect Method for Arsenic Analysis for the Rural Areas of West Bengal</td>
<td>DST, New Delhi</td>
<td>Rs. 5.60 Lakhs</td>
</tr>
<tr>
<td>7.</td>
<td>Evaluation of bituminous mixes using bituminous pavement analyzer</td>
<td>IIT Kharagpur</td>
<td>Rs. 5.00 Lakhs</td>
</tr>
<tr>
<td>8.</td>
<td>Exploratory investigation on development of damage mechanics based methodologies for lifing of aeroengine components</td>
<td>DMRL, Hyderabad</td>
<td>Rs. 10.00 Lakhs</td>
</tr>
</tbody>
</table>
9. Modeling & Monitoring of Landslide Hazard in Sikkim Himalayas
   DST, New Delhi Rs. 23.00 Lakhs.

10. Multi-scale modeling to study the role of atomic scale defects in CNT-based nanocomposites
    DST, New Delhi Rs. 20.50 Lakhs

11. Multiscale modeling of small scale interfacial phenomena in carbon nanotube reinforced composites
    IIT Kharagpur Rs. 3.00 Lakhs

12. Production of bioenergy during wastewater treatment
    Ministry of Environment and Forest, New Delhi Rs. 13.22 Lakhs

13. Recycled Aggregate based concrete
    UGC, New Delhi Rs. 8.96 Lakhs

14. Resource mapping / Flood analysis of Ajay and Mayurakshi rivers using RS/GIS
    DST, New Delhi Rs. 15.00 Lakhs

15. Rural Roads Performance Study
    National Rural Roads Development Agency Rs. 10.00 Lakhs

16. Seismic Evaluation of Aged Concrete Gravity Dams
    IIT Kharagpur Rs. 3.00 Lakhs

17. Simulation studies of mechanical behaviour and failure of carbon nanotubes
    DMRL, Hyderabad Rs. 10.00 Lakhs

18. Software capabilities for reliability analysis of ship structures
    Indian Register of Shipping Rs. 4.00 Lakhs

19. Status of Landslide Problem in Sikkim
    DST, New Delhi Rs. 0.30 Lakhs

20. Synthesis and characterization of mono and bimetallic nanoparticles on supported systems and their application for the degradation of organic pollutant
    IIT Kharagpur Rs. 5.00 Lakhs

21. Theoretical & Experimental Investigation of Strain Localization in Cohesive Soils under Plane Strain Condition
    DST, New Delhi Rs. 13.00 Lakhs

### Consultancy Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Adequacy of measures taken by Rourkela Steel Plant regarding the sewage treatment</td>
<td>SAIL, Rourkela</td>
<td>Rs. 8.08 Lakhs</td>
</tr>
<tr>
<td></td>
<td>system of Rourkela Steel Plant Township</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Checking of Design of siphon aqueduct over river Sagada at RD 2820m of Upper Indravati right main extension canal</td>
<td>Upper Indravati Irrigation Project, Govt. of Orissa</td>
<td>Rs. 5.00 Lakhs</td>
</tr>
<tr>
<td>3.</td>
<td>Checking of Launching scheme for Railway over bridges on NH-41</td>
<td>CWHEC-HCIL (J.V.)</td>
<td>Rs. 3.50 Lakhs</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Contractor/Institution</td>
<td>Amount</td>
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<tr>
<td>---</td>
<td>----------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>4.</td>
<td>Checking of Structural Designs &amp; Drawings of Lucknow Airport</td>
<td>S. Ghosh &amp; Associates</td>
<td>Rs. 9.00 Lakhs</td>
</tr>
<tr>
<td>5.</td>
<td>Checking of the design of lighting masts</td>
<td>B. P. Projects, Kolkata</td>
<td>Rs. 1.50 Lakhs</td>
</tr>
<tr>
<td>6.</td>
<td>Checking of the Distressed water tank</td>
<td>P.H. Division-III, Govt. of Orissa</td>
<td>Rs. 1.01 Lakhs</td>
</tr>
<tr>
<td>7.</td>
<td>Checking of the design of lighting masts</td>
<td>B. P. Projects, Kolkata</td>
<td>Rs. 1.50 Lakhs</td>
</tr>
<tr>
<td>8.</td>
<td>City Development Plan for Haldia</td>
<td>Haldia Development Authority, Haldia</td>
<td>Rs. 22.47 Lakhs</td>
</tr>
<tr>
<td>9.</td>
<td>Construction of arterial road and back up area behind berth no. 2 of Haldia Dock Complex</td>
<td>Haldia Dock Complex, Kolkata Port Trust</td>
<td>Rs. 4.50 Lakhs</td>
</tr>
<tr>
<td>10.</td>
<td>Construction of Girls' Hostel - Rani Laxmibai Hall of Residence</td>
<td>IIT Kharagpur</td>
<td>Rs. 17.60 Lakhs</td>
</tr>
<tr>
<td>11.</td>
<td>Cyclone risk assessment for West Bengal coast</td>
<td>Department of Relief, Govt. of West Bengal PMO</td>
<td>Rs. 40.00 Lakhs</td>
</tr>
<tr>
<td>12.</td>
<td>Cyclone Shelter at Orissa coast</td>
<td>IRCON International Ltd., Chennai</td>
<td>Rs. 25.00 Lakhs</td>
</tr>
<tr>
<td>13.</td>
<td>Design checking of Road Over Bridges</td>
<td>Southeastern Coalfields Limited, Bilaspur</td>
<td>Rs. 6.06 Lakhs</td>
</tr>
<tr>
<td>14.</td>
<td>Design of Coal Transportation Roads</td>
<td>Industrial Water Engineers, Malaysia BARC, Mumbai</td>
<td>Rs. 6.75 Lakhs</td>
</tr>
<tr>
<td>15.</td>
<td>Design of UASB reactor for bio-diesel wastewater treatment</td>
<td>Shantiniketan - Sriniketan Development Authority</td>
<td>Rs. 4.00 Lakhs</td>
</tr>
<tr>
<td>16.</td>
<td>Development of reliability based criteria for containment design</td>
<td>Development of Software for the</td>
<td>Rs. 9.50 Lakhs</td>
</tr>
<tr>
<td>17.</td>
<td>Development of Software for the analysis of steel-cord pipe conveyor belt</td>
<td>Phoenix-Yule Ltd.</td>
<td>Rs. 2.20 Lakhs</td>
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<td>18.</td>
<td>Drainage plan for Shantiniketan - Sriniketan</td>
<td>Shantiniketan - Sriniketan Development Authority</td>
<td>Rs. 15.00 Lakhs</td>
</tr>
<tr>
<td>19.</td>
<td>Environmental Impact Assessment (EIA) and Environmental Management Plan(EMP) for the proposed Dwarakeswar Gandheswari Reservoir project (West Bengal)</td>
<td>Irrigation &amp; Waterways Directorate, Govt. of West Bengal</td>
<td>Rs. 20.22 Lakhs</td>
</tr>
<tr>
<td>20.</td>
<td>Health Monitoring of a building Structure</td>
<td>West Bengal Housing Board, Kolkata</td>
<td>Rs. 3.00 Lakhs</td>
</tr>
<tr>
<td>21.</td>
<td>Health monitoring of Factory building structure</td>
<td>Titagarh Wagons Ltd.</td>
<td>Rs. 4.00 Lakhs</td>
</tr>
<tr>
<td>22.</td>
<td>Improvement of Drainage Facilities at dock and adjoining area at Haldia Dock Complex</td>
<td>Haldia Dock Complex, Haldia</td>
<td>Rs. 20.50 Lakhs</td>
</tr>
<tr>
<td>23.</td>
<td>Improvement of Road Connectivity, Traffic Mobility and Safety in the Influence Area of Keventer Premises in Barasat</td>
<td>Keventer Fresh Limited, Kolkata</td>
<td>Rs. 2.02 Lakhs</td>
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<tr>
<td>No.</td>
<td>Description</td>
<td>Implementor</td>
<td>Amount</td>
</tr>
<tr>
<td>-----</td>
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<tr>
<td>24.</td>
<td>Investigation of Rutting Failure on NH-2</td>
<td>Progressive Construction</td>
<td>Rs. 3.00 Lakhs</td>
</tr>
<tr>
<td>25.</td>
<td>Measures for Improving Traffic Mobility around the Proposed Mixed Use Development at Rishra</td>
<td>Keventer Fresh Limited, Kolkata</td>
<td>Rs. 2.70 Lakhs</td>
</tr>
<tr>
<td>26.</td>
<td>Monitoring of RE Wall reconstruction at km 18.2, NH-6</td>
<td>NHAI, New Delhi</td>
<td>Rs. 2.00 Lakhs</td>
</tr>
<tr>
<td>27.</td>
<td>Non-destructive testing at BRBNML, Salboni</td>
<td>Espace Planning Services Pvt. Ltd.</td>
<td>Rs. 3.00 Lakhs</td>
</tr>
<tr>
<td>28.</td>
<td>Paschimanchal Perspective Plan for 2020</td>
<td>Paschimanchal Unnayan Parishad, Govt. of West Bengal</td>
<td>Rs. 10.00 Lakhs</td>
</tr>
<tr>
<td>29.</td>
<td>Preparation of Aizawl Master Plan</td>
<td>Aizawl Development Authority, Govt. of Mizoram</td>
<td>Rs. 70.22 Lakhs</td>
</tr>
<tr>
<td>30.</td>
<td>Preparation of City Development Plan for Burdwan Planning Area</td>
<td>Burdwan Development Authority, Burdwan</td>
<td>Rs. 11.23 Lakhs</td>
</tr>
<tr>
<td>31.</td>
<td>Preparation of detailed project Report for periphery road</td>
<td>Bharatiya Note Mudran Ltd., Salboni</td>
<td>Rs. 10.00 Lakhs</td>
</tr>
<tr>
<td>32.</td>
<td>Preparation of Master Plan of Drainage System in Planning Area of Sriniketan Santiniketan Development Authority (SSDA)</td>
<td>Executive Officer, SSDA Bholpur</td>
<td>Rs. 15.00 Lakhs</td>
</tr>
<tr>
<td>33.</td>
<td>Preparation of Perspective Plan–Vision 2030 and Comprehensive development Plan areas of Bhubaneswar and Cuttack Development Authority</td>
<td>Housing and Urban Development Department Govt. of Orissa</td>
<td>Rs. 165.29 Lakhs</td>
</tr>
<tr>
<td>34.</td>
<td>Preparation of Storm Water drainage Master Plan for Haldia Municipal Area</td>
<td>Haldia Development Authority, Haldia</td>
<td>Rs. 25.84 Lakhs</td>
</tr>
<tr>
<td>35.</td>
<td>Proof checking report on feasibility study for desilting and renovation of lake system in Indian Botanic Garden, BSI at Howrah</td>
<td>Ministry of Environment &amp; Forests, New Delhi</td>
<td>Rs. 3.36 Lakhs</td>
</tr>
<tr>
<td>36.</td>
<td>Rain Water Harvesting for Tata Metaliks Limited Kharagpur Plants</td>
<td>Tata Metaliks Ltd., Kharagpur</td>
<td>Rs. 3.35 Lakhs</td>
</tr>
<tr>
<td>37.</td>
<td>Rainwater Harvesting in BRBNMPL Campus, Salboni</td>
<td>Bharatiya Reserva Bank Note Mudran (P) Ltd., Salboni</td>
<td>Rs. 5.00 Lakhs</td>
</tr>
<tr>
<td>38.</td>
<td>Scrutiny of Technical Proposals for Pradhan Mantri Gram Sadak Yojana work</td>
<td>NRRDA, Delhi</td>
<td>Rs. 5.50 Lakhs</td>
</tr>
<tr>
<td>39.</td>
<td>Software capabilities for reliability analysis of ship structures</td>
<td>Indian Register of Shipping</td>
<td>Rs. 4.00 Lakhs</td>
</tr>
<tr>
<td>40.</td>
<td>Study of water supply distribution / storage and source availability for Darjeeling Municipality</td>
<td>District Magistrate, Darjeeling</td>
<td>Rs. 4.82 Lakhs</td>
</tr>
<tr>
<td>41.</td>
<td>Sump model study for CW system pkg - NTPC</td>
<td>Kirloskar Brothers Limited</td>
<td>Rs. 9.00 Lakhs</td>
</tr>
<tr>
<td>42.</td>
<td>Testing &amp; Evaluation of 100m Webel Mediatronics</td>
<td>Webel Mediatronics</td>
<td>Rs. 4.07 Lakhs</td>
</tr>
</tbody>
</table>
Transmission Tower at AIR Kohima Ltd.
43. Traffic Study for Project - ITC East India, Kolkata Wilbur Smith Associates Rs. 1.80 Lakhs
44. Traffic Study for the Proposed Mixed Use Township Complex in Kasba Area, Kolkata Bengal-NRI Rs. 2.40 Lakhs
45. Vetting of design and drawing of railway crossing structure at chainage of 175-20 of right main canal and at chainage 244-00 of left main canal of Bihar Water resources Department, Govt of Jharkhand Rs. 4.00 Lakhs
46. Vetting of Pavement Design for Tezpur Airfield CE (AF), Shillong Zone, Shillong Rs. 1.50 Lakhs
47. Vikram Sarabhai Residential Complex IIT, Kharagpur Rs. 9.60 Lakhs

VISITS ABROAD BY FACULTY MEMBER

1. Prof. Subhasish Dey
   Università della Calabria, Italy
   To offer 2-day short course on "Turbulent flow, sediment transport and scour"
2. Prof. Subhasish Dey
   Politecnico di Milano, Italy
   To offer 2-day short course on "Sediment transport and scour"
3. Dr. Debasis Roy
   Taipei, Taiwan
   Attend 3rd International Conference on Site Characterization, moderate session, present paper
4. Dr. Ashok Kumar Gupta
   Texas A&M University Kingsville, Texas
   To develop research collaboration in the area of air quality
5. Dr. Baidurya Bhattacharya
   Tokyo, Japan
   Attend the 10th International Conference on Application of Statistics and Probability in Civil Engineering (4 days)
6. Dr. Makarand Madha Ghangrekar
   Moncton, Canada
   Participation in the conference
7. Dr. Bhargab Maitra
   University of Dar Es Salaam, Tanzania
   External Examiner for the Department of Transportation and Geotechnical Engineering
8. Dr. Bhargab Maitra
   Technische Universität Darmstadt, Germany
   Invited Presentation for Workshop and Congress: Traffic and Transport 2030

INVITED LECTURES BY FACULTY MEMBERS

1. Prof. Subhasish Dey
   Turbulent flow over sediment beds and sediment threshold (ISI Kolkata)
2. Dr. Sudhir Kumar Barai
   Improving Engineering Education: ICT in Learning and Teaching (NIT Rourkela)
3. Dr. Anjali Pal
   Selected toxic organic pollutants and their photodegradation: A green chemistry approach (Junwani, Bhilai (C. G.))

4. Dr. Dilip Kumar Baidya
   Earthquake and Liquefaction of soils (NIT, Culicutt)

5. Dr. Baidurya Bhattacharya
   Fracture and Fracture resistance of carbon nanotubes. Workshop on Mechanical Behaviour of Systems at Small Length Scales -2) (Indian Institute of Science, Bangallore)

6. Dr. Venkappayya R. Desai
   Concept models on 'Rainwater powered pumped storage hydro turbine (RAPPORT)' & 'Relief well (REWEL)' (Anna University, Chennai)

7. Dr. M. Amaranatha Reddy
   Structural Evaluation of Pavements (NIT Rourkela)

8. Prof. Sriram Kumar Bhattacharyya
   Application of Structural Dynamics in RCC Analysis & Design (NIT, Rourkela)

9. Prof. Sriram Kumar Bhattacharyya
   Sloshing of Liquid – Abuse & Use (NIT Rourkela)

10. Dr. Shaikh Jahangir Hossain
    Newmark-Scheme on Manifold of Finite Rotations and its Applications (IIT, Madras)

LECTURE BY VISITING EXPERT

1. Prof. S Khasnabis, Professor of Civil Engineering and Interim Associate Dean of Research, College of Engineering, Wayne State University, Detroit, Michigan, USA
   Asset Management Strategies to Optimize Transportation Investment

2. Prof. Manfred Boltze, Professor, Darmstadt University, Germany
   Traffic Management in the German Region Frankfurt Rhein Main

3. Prof. Debasish Roy, Department of Civil Engineering, Indian Institute of Science, Bangalore
   Smooth Finite Elements through Tensor-product and Triangular B-splines

4. Prof. Debasish Roy, Department of Civil Engineering, Indian Institute of Science, Bangalore
   Statistical Methods in Civil Engineering

5. Prof. C. S. Manohar, Civil Engineering Department, Indian Institute of Science, Bangalore
   Probabilistic Methods for Nonlinear Structural System Identification

THESES (Doctoral and MS)

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ammasi Mani</td>
<td>Application of Artificial Neural Networks and Rating curve in flood Prediction</td>
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</table>
2. Navneet P. Singh  
   Local Scour at Submerged Pipelines and Their Supports
3. S. Ayoob  
   Sorptive Removal of Fluoride From Drinking Water Alumina Cement Granules

**BOOK PUBLISHED**

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the Author(s)</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
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<tbody>
<tr>
<td>1.</td>
<td>Prof. J. N. Bandyopadhyay</td>
<td>Design of Concrete Structures</td>
<td>Prentice-Hall of India Private Limited</td>
<td>2008</td>
</tr>
</tbody>
</table>

**LAURELS & DISTINCTIONS**

1. Dr. Sudhir Kumar Barai  
   Best Paper Award : Int. Association for Automation and Robotics in Construction September 2007
2. Dr. Sudhir Kumar Barai  
   Erskine Visiting Fellowship : Visit to University of Canterbury, New Zealand May-June 2008
3. Prof. Subhasish Dey  
   Fellow of Indian National Academy of Engineers (2008)
4. Dr. Makarand Madha Ghangrekar  
   Prof. R. C. Singh Medal by Institution of Engineers (India), for the year 2007

**SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED**

1. Solid and Hazardous Waste Management  
   August 13-17, 2007
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

HEAD : Professor Indranil Sengupta

FACULTY

Professor :

Chakrabarti, Partha Pratim Ph.D.(IIT Kharagpur), Computer Science & Engineering
Dasgupta, Pallab Ph.D.(IIT Kharagpur), VLSI CAD & Electronic Design Automation, Formal Verification, Verification of Automotive Control
Ghose, Sujoy Ph.D.(IIT Kharagpur), Networks, Algorithms, AI, Info Systems
Kumar, Rajeev Ph.D.(Sheffield), Programming Language Systems, Software Engineering, Embedded & Multimedia Systems, Evolutionary Algorithms
Majumder, Arun Kumar Ph.D.(Calcutta), Ph.D.(Florida), Data and Knowledgebased Systems, Medical Informatics, Design Automation
Mall, Rajib Ph.D.(IISc Bangalore), Software Engineering, Real-Time Systems, Testing Object-Oriented Programs
Mukhopadhyay, Jayanta Ph.D.(IIT Kharagpur), Image Processing, Computer Vision, Computer Graphics, Pattern Recognition, Medical Informatics
Pal, Ajit Ph.D.(Calcutta University), VLSI, Embedded Systems, Networking
Pal, Sudebkumar Prasant Ph.D.(IISc. Bangalore), Design and analysis of algorithms, Computational geometry
Roychowdhury, Dipanwita Ph.D.(IIT Kharagpur), Cryptography, Cellular Automata, VLSI
Sarkar, Dipankar Ph.D.(IIT Kharagpur), Formal Verification, Symbolic Logic and Automated Reasoning
Sarkar, Sudeshna Ph.D.(IIT Kharagpur), Artificial Intelligence, Machine Learning, Information Retrieval, Natural Language Processing
Sengupta, Indranil Ph.D.(Calcutta University), Computer Science and Engineering

Associate Professor :

Gupta, Arobinda Ph.D.(Iowa), Distributed Systems
Mandal, Chittaranjan Ph.D.(IIT Kharagpur), Internet Technologies, VLSI, System Verification

Assistant Professor :
Bishnu, Arijit  
Ph.D., Algorithms for digital imaging, Computational Geometry and applications

Das, Abhijit  
Ph.D.(IISc. Bangalore), Arithmetic and algebraic algorithms, Cryptography and network security

Ganguly, Niloy  
Ph.D.(BESU, Calcutta), Computer Science

Mitra, Pabitra  
Ph.D.(ISI, Calcutta), Machine learning, Information retrieval

Lecturer :

Dey, Partha Sarathi  

**FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION**

Faculty Appointment :

<table>
<thead>
<tr>
<th>Name</th>
<th>Designation</th>
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<tbody>
<tr>
<td>Dr. Gaurav Harit</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Dr. Partha Bhowmik</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Dr. Debdeep Mukhopadhyay</td>
<td>Assistant Professor</td>
</tr>
</tbody>
</table>

**RESEARCH AND DEVELOPMENT**

**Brief descriptions of on-going activities :**

1. Baisakhi Keyboard ( A Bangla Keyboard)
2. Microcontroller for Sensor Networks

**Thrust Areas :**

1. Artificial Intelligence
2. Assistive Technology
3. Bioinformatics
4. Combinatorial and Computational Geometry
5. Computer Graphics
6. Computer Networks
7. Cryptography
8. Databases
9. Embedded Systems
10. Fault Tolerant Computing
11. Formal Verification
12. Image Processing and Computer Vision
13. Mobile Computing
14. Multimedia
15. Natural Language Processing
16. Object Oriented Design Tools
17. Parallel and Distributed Processing
18. Real Time Systems
19. Software Engineering
20. Speech Recognition and Synthesis
21. VLSI Design and CAD tools
22. Quantum Information and Computation

New Acquisitions:

1. The laboratory for "Geometric, Combinatorial and Algebraic Computation" is a new thematic laboratory in CSE department

ON-GOING RESEARCH PROJECTS

Sponsored Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A Multilingual Processing of Language in a Lexico-Semantic Perspective</td>
<td>STIC-Asia</td>
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<tr>
<td>2.</td>
<td>Advanced VLSI Consortium</td>
<td>Multiple Consortium</td>
<td>Rs.100.00 Lakh</td>
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<tr>
<td>3.</td>
<td>An Integrated Framework for Testing</td>
<td>DST, New Delhi</td>
<td>Rs.10.00 Lakh</td>
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<tr>
<td>4.</td>
<td>Approximate Search and Coverage Based Analysis</td>
<td>IBM Faculty Award</td>
<td>Rs.3.00 Lakh</td>
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<tr>
<td>5.</td>
<td>Automated Processing of Text Documents</td>
<td>MHRD, New Delhi</td>
<td>Rs.8.00 Lakh</td>
</tr>
<tr>
<td>6.</td>
<td>Combinatorial and Geometric Approaches to Digital Imaging Applications</td>
<td>IIT Kharagpur</td>
<td>Rs.1.35 Lakh</td>
</tr>
<tr>
<td>7.</td>
<td>Cross Language Information Access</td>
<td>MCIT, New Delhi</td>
<td>Rs.65.00 Lakh</td>
</tr>
<tr>
<td>8.</td>
<td>Design and Analysis of an Efficient Cryptosystem for Safe Messaging over Vehicular Adhoc Network</td>
<td>General Motors, Bangalore</td>
<td>Rs.20.00 Lakh</td>
</tr>
<tr>
<td>9.</td>
<td>Design and development of a signal processing system-on-chip (SOC) for micro sensor</td>
<td>MHRD, New Delhi</td>
<td>Rs.6.00 Lakh</td>
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<tr>
<td>10.</td>
<td>Design and implementation of a cryptosystem resistant to vulnerabilities and side channel attacks</td>
<td>DIT, New Delhi</td>
<td>Rs.138.00 Lakh</td>
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<td>11.</td>
<td>Design of a processor having an asynchronous ALU to counter side channel attack</td>
<td>ISRO</td>
<td>Rs.0.50 Lakh</td>
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<tr>
<td>12.</td>
<td>Design of An Indigenous Encryption Algorithm for SDH-16</td>
<td>Indian Telephone Industry, Bangalore</td>
<td>Rs.40.00 Lakh</td>
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<tr>
<td>13.</td>
<td>Designing robust and self-organised p2p system over peer-to-peer networks</td>
<td>DST, New Delhi</td>
<td>Rs.20.00 Lakh</td>
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<td>14.</td>
<td>Developing robust and efficient services for open source Internet telephony over</td>
<td>DST-BMBF</td>
<td>Rs.3.92 Lakh</td>
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<tr>
<td>Project Description</td>
<td>Institution</td>
<td>Budget</td>
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<td>------------------------------------------------------------------------------------</td>
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<tr>
<td>Developing robust services for peer to peer networks</td>
<td>IIT Kharagpur</td>
<td>Rs.3.00 Lakhs</td>
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<tr>
<td>Development of Cross-Lingual Information Access (CLIA) system</td>
<td>MCIT, New Delhi</td>
<td>Rs.61.51 Lakhs</td>
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<tr>
<td>Development of Custom Application Language</td>
<td>Usha Communications, Kolkata</td>
<td>Rs.2.00 Lakhs</td>
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<tr>
<td>Development of Indian Language to Indian Language Machine Translation System (IL-IL MT)</td>
<td>MCIT, New Delhi</td>
<td>Rs.46.00 Lakhs</td>
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<tr>
<td>Development of infrastructure for centre of excellence on information assurance</td>
<td>Headquarters Integrated Defense Staff, Ministry of Defense, New Delhi</td>
<td>Rs.50.00 Lakhs</td>
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<tr>
<td>Development of Multimedia Hardware-Software system for the Education of Students with Cerebral Palsy and Communication</td>
<td>Ministry of Social Justice and Empowerment, New Delhi</td>
<td>Rs.17.00 Lakhs</td>
<td></td>
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<td>Development of Spatio-Temporal Access Control Models</td>
<td>DST, New Delhi</td>
<td>Rs.16.18 Lakhs</td>
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<td>Distributed data synchronization algorithms (ASD)</td>
<td>Applied Research Works</td>
<td>Rs.2.16 Lakhs</td>
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<tr>
<td>Efficient testing for system-on-chip design - a new VLSI manufacturing paradigm</td>
<td>DST, New Delhi</td>
<td>Rs.9.40 Lakhs</td>
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<tr>
<td>Enabling Research with ICT</td>
<td>National Institute of Mentally Handicapped, Hyderabad</td>
<td>Rs.5.00 Lakhs</td>
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<tr>
<td>Encompression - Encryption in Compressed Domain</td>
<td>ISRO, Ahmedabad</td>
<td>Rs.2.00 Lakhs</td>
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<tr>
<td>Extending the Frontiers of Design Validation using Formal Property Verification and Symbolic Simulation</td>
<td>DST, New Delhi</td>
<td>Rs.19.29 Lakhs</td>
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<td>Fundamental research in information assurance</td>
<td>Headquarters Integrated Defense Staff, Ministry of Defense, New Delhi</td>
<td>Rs.48.10 Lakhs</td>
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<tr>
<td>Games in System Design and Verification</td>
<td>DST, New Delhi</td>
<td>Rs.8.40 Lakhs</td>
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<tr>
<td>GM Collaborative Research Laboratory on ECS for Education</td>
<td>General Motors</td>
<td>Rs.125.00 Lakhs</td>
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<tr>
<td>High Level Synthesis and Verification of Digital Circuits</td>
<td>MHRD, New Delhi</td>
<td>Rs.6.00 Lakhs</td>
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<tr>
<td>High Speed End to End ASIC Design of Rijndael for AES Rijndael Cryptosystem</td>
<td>ISRO, Ahmedabad</td>
<td>Rs.13.50 Lakhs</td>
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<tr>
<td>INAE Visveswarya Chair Professor Project</td>
<td>INAE, New Delhi</td>
<td>Rs.16.74 Lakhs</td>
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</table>
33. Indian Language Machine Translation
MCIT, New Delhi
Rs.45.00 Lakhs

34. Investigation of Cryptanalytic Techniques
Headquarters, Integrated Defence Staff, Ministry of Defence, New Delhi
Rs.44.30 Lakhs

35. Low Power Circuits and Systems
Intel Corporation, USA
Rs.22.00 Lakhs

36. Machine Learning for Cross Language Information Retrieval
IIT Kharagpur
Rs.3.00 Lakhs

37. Modelling and Management of Dynamic Multimedia Objects
DST, New Delhi
Rs.18.00 Lakhs

38. Multimedia Modeling of Dynamic Objects
DST, New Delhi
Rs.18.00 Lakhs

MHRD, New Delhi
Rs.10.00 Lakhs

40. Nokia Mobile Phone Interface Verification
Kingston University & Nokia
Rs.4.50 Lakhs

41. Shruti: A Vernacular Speech Recognition System
Media Lab Asia
Rs.25.00 Lakhs

42. Special Manpower Development Programme for VLSI Design and Related Software (SMDP-II)
MCIT, New Delhi
Rs.90.00 Lakhs

43. Survivable System Architecture with Intrusion Tolerance, Containment and Recovery in Distributed Environment
MCIT, New Delhi
Rs.55.00 Lakhs

44. VLSI and Wireless Technologies
IIT Kharagpur
Rs.5.00 Lakhs

45. Web Enabled Medical Information Access Using Handheld Devices in a Wireless Environment for Telemedicine Applications
MCIT, New Delhi
Rs.62.10 Lakhs

Consultancy Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sanyog: A Communication System for the Speech Impaired and Children with Cerebral Palsy Phase II</td>
<td>Media Lab Asia</td>
<td>Rs.72.00 Lakhs</td>
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<tr>
<td>2</td>
<td>Advisor for Communications and Networking Plan</td>
<td>National Insurance Company</td>
<td>Rs.2.40 Lakhs</td>
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<tr>
<td>3</td>
<td>Automatic Property Extraction from System Verilog Test Benches</td>
<td>Synopsys (India) Pvt. Ltd.</td>
<td>Rs.11.00 Lakhs</td>
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<tr>
<td>4</td>
<td>Behavioral Modeling and Verification of Mixed-signal Circuits</td>
<td>National Semiconductor Corp, USA</td>
<td>Rs.27.00 Lakhs</td>
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<tr>
<td>5</td>
<td>Call Centre &amp; Data Warehousing</td>
<td>WBSEB</td>
<td>Rs.7.00 Lakhs</td>
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<td>6</td>
<td>Coal Net (Phase I &amp; 2)</td>
<td>Hoogly River Bridge Commissioners</td>
<td>Rs.2725.00 Lakhs</td>
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<td>7</td>
<td>Computerized Toll bridge</td>
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<td>Rs.10.00 Lakhs</td>
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<tr>
<td>No.</td>
<td>Project Description</td>
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<td>Amount</td>
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<td>8.</td>
<td>Concept Note for EDA Park</td>
<td>DIT, Govt. of West Bengal</td>
<td>Rs.6.00 Lakhs</td>
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<td>9.</td>
<td>Content Based Search in Satellite Image Repository</td>
<td>Defence Electronics Lab.</td>
<td>Rs.9.50 Lakhs</td>
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<td>10.</td>
<td>Coverage metrics for design intent coverage</td>
<td>Intel Corporation, USA</td>
<td>Rs.22.50 Lakhs</td>
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<tr>
<td>11.</td>
<td>Deployment of Telemedicine in Tripura</td>
<td>Min. of Information Technology, Govt. of India and WECS Ltd., Kolkata</td>
<td>Rs.27.00 Lakhs</td>
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<tr>
<td>12.</td>
<td>Design IT Roadmap for HCL</td>
<td>Hindusthan Copper Limited</td>
<td>Rs.7.30 Lakhs</td>
</tr>
<tr>
<td>13.</td>
<td>Development of Telemedicine in West Bengal Government Hospitals</td>
<td>Min. of Information Technology, Govt. of India and WEBEL, Kolkata</td>
<td>Rs.29.00 Lakhs</td>
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<tr>
<td>14.</td>
<td>Developments tools for CR-16</td>
<td>National Semiconductor Corporation, USA</td>
<td>Rs.112.50 Lakhs</td>
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<td>15.</td>
<td>ERP Implementation (for Bridge &amp; Roof)</td>
<td>Bridge &amp; Roof</td>
<td>Rs.4.50 Lakhs</td>
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<tr>
<td>16.</td>
<td>External Network Consultant for West Bengal State Wide Area Network (WBSWAN) Expansion Project</td>
<td>Ministry of Information Technology, Govt. of India, and WEBEL Techn. Ltd. Kolkata</td>
<td>Rs.30.00 Lakhs</td>
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<td>17.</td>
<td>Formal Methods for Component Based Design Validation</td>
<td>General Motors Collaborative Research Lab.</td>
<td>Rs.23.00 Lakhs</td>
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<td>18.</td>
<td>Formal Verification of Web Interfaces</td>
<td>Google Inc.</td>
<td>Rs.20.00 Lakhs</td>
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<td>19.</td>
<td>Functional Extraction for Automatic Stimulus Generation</td>
<td>National Semiconductor Corp., USA</td>
<td>Rs.22.50 Lakhs</td>
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<td>20.</td>
<td>GM Collaborative Research Laboratory on Electronics, Controls and Software : Projects</td>
<td>General Motors</td>
<td>Rs.425.00 Lakhs</td>
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<td>21.</td>
<td>Hindi Named Entity Recognition</td>
<td>Microsoft Research</td>
<td>Rs.10.00 Lakhs</td>
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<td>22.</td>
<td>HP-UX lan driver development, as project</td>
<td>Pursuit Software Inc.</td>
<td>Rs.20.00 Lakhs</td>
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<tr>
<td>23.</td>
<td>Interlinking of JIS campuses</td>
<td>JIS Group, Kolkata</td>
<td>Rs.1.00 Lakhs</td>
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<td>24.</td>
<td>IT Consultancy</td>
<td>UCO Bank</td>
<td>Rs.2.50 Lakhs</td>
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<tr>
<td>25.</td>
<td>IT Implementation and Computerization of DVC</td>
<td>Damodar Valley Corporation</td>
<td>Rs.19.10 Lakhs</td>
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<td>26.</td>
<td>IT Roadmap for WBSETCL</td>
<td>West Bengal State Electricity Transmission Co. Ltd.</td>
<td>Rs.1.12 Lakhs</td>
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<td>27.</td>
<td>LAN Design for Vidyut Bhavan</td>
<td>WBSEB</td>
<td>Rs.0.15 Lakhs</td>
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<td>28.</td>
<td>Memory Compiler</td>
<td>National Semiconductor Corporation, USA</td>
<td>Rs.50.00 Lakhs</td>
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<td>No.</td>
<td>Description</td>
<td>Organization</td>
<td>Cost (Lakhs)</td>
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<tr>
<td>29.</td>
<td>Multimodal Participatory Tutoring System for Rural Schools</td>
<td>Media Lab Asia</td>
<td>Rs.24.00</td>
</tr>
<tr>
<td>30.</td>
<td>Nabarun Core Technology</td>
<td>Grameen Sanchar Society, Kolkata</td>
<td>Rs.50.00</td>
</tr>
<tr>
<td>31.</td>
<td>Named Entity Recognition</td>
<td>Microsoft Research Inc.</td>
<td>Rs.10.00</td>
</tr>
<tr>
<td>32.</td>
<td>Named Entity Recognition and Part of Speech tagging for Hindi</td>
<td>Microsoft Research India</td>
<td>Rs.10.00</td>
</tr>
<tr>
<td>33.</td>
<td>Object-Oriented (C#/.NET centric) Courseware Development</td>
<td>Microsoft Corp., USA</td>
<td>Rs.11.00</td>
</tr>
<tr>
<td>34.</td>
<td>Personalized content and commerce recommendations</td>
<td>Minekey Inc.</td>
<td>Rs.62.00</td>
</tr>
<tr>
<td>35.</td>
<td>Position Paper on Development of Semiconductor Facility</td>
<td>Xenitis Infotech.</td>
<td>Rs.3.75</td>
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<tr>
<td>36.</td>
<td>Road Map for ERP</td>
<td>DVC</td>
<td>Rs.1.00</td>
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<td>37.</td>
<td>Roadmap for ERP Implementation for DVC</td>
<td>Damodar valley Corporation</td>
<td>Rs.1.00</td>
</tr>
<tr>
<td>38.</td>
<td>Setting up of Telemedicine Facilities in Tripura</td>
<td>Ministry of Information Technology, Govt. of India and WEBEL, Kolkata</td>
<td>Rs.27.00</td>
</tr>
<tr>
<td>39.</td>
<td>Shruti: Embedded Text to Speech Systems for Indian Languages Phase II</td>
<td>Media Lab Asia</td>
<td>Rs.21.00</td>
</tr>
<tr>
<td>40.</td>
<td>Software Tools for Embedded Systems</td>
<td>National Semiconductor Corporation, USA</td>
<td>Rs.50.00</td>
</tr>
<tr>
<td>41.</td>
<td>Synthesis and Property Extraction from System Verilog Models</td>
<td>Synopsys India Pvt. Ltd.</td>
<td>Rs.26.00</td>
</tr>
<tr>
<td>42.</td>
<td>Technical Consultancy on IT Matters</td>
<td>UCO Bank</td>
<td>Rs.1.00</td>
</tr>
<tr>
<td>43.</td>
<td>Telemedicine (DOTP)</td>
<td>WEBEL</td>
<td>Rs.29.00</td>
</tr>
<tr>
<td>44.</td>
<td>Telemedicine (DTGH)</td>
<td>WEBEL</td>
<td>Rs.29.00</td>
</tr>
<tr>
<td>45.</td>
<td>Telemedicine on Ophthalmology (TPLM)</td>
<td>WEBEL, Kolkata</td>
<td>Rs.3.00</td>
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<tr>
<td>46.</td>
<td>Telmedicine (SUTF)</td>
<td>WEBEL</td>
<td>Rs.36.00</td>
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<tr>
<td>47.</td>
<td>Template Extraction</td>
<td>National Semiconductor Corporation, USA</td>
<td>Rs.100.00</td>
</tr>
<tr>
<td>48.</td>
<td>Toll Booth for Vidyasagar Setu</td>
<td>HRBC</td>
<td>Rs.9.50</td>
</tr>
<tr>
<td>49.</td>
<td>Training and Research Analysis</td>
<td>Infosys Ltd. Bangalore</td>
<td>Rs.1.60</td>
</tr>
<tr>
<td>50.</td>
<td>Verification in Virtual Silicon</td>
<td>Virtio Corporation</td>
<td>Rs.50.00</td>
</tr>
<tr>
<td>51.</td>
<td>Verification of UML Models</td>
<td>General Motors</td>
<td>Rs.23.00</td>
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<tr>
<td>52.</td>
<td>W.B. State Wide Area Network</td>
<td>WTL</td>
<td>Rs.30.00</td>
</tr>
<tr>
<td>53.</td>
<td>Web portal Development Consutancy</td>
<td>WBSEDCL</td>
<td>Rs.3.00</td>
</tr>
<tr>
<td>54.</td>
<td>Zonal Data Warehouse and Online CRM Project of CRM</td>
<td>WBSEB</td>
<td>Rs.7.00</td>
</tr>
</tbody>
</table>

**VISITS ABROAD BY FACULTY MEMBER**

1. Prof. Jayanta Mukhopadhyay Research (University of Southern California, Los
2. Prof. Indranil Sengupta Participation and delivering a tutorial talk at TENCON 2007 (Taipei, Taiwan) October 30 – November 02, 2007

3. Prof. Rajev Kumar Participation in GECCO-07 (London) 1 week

4. Prof. Rajev Kumar Participation in ICIP 2007 (San Antonio, Texas, USA) 4 days

5. Prof. Pallab Dasgupta Delivering DAC Tutorial at San Diego, and visiting National Semiconductors at Santa Clara (California, USA) June 2-10, 2007


INVITED LECTURES BY FACULTY MEMBERS

1. Prof. Sudebkumar Prasant Pal Combinatorial methods for studying LOCC incomparability (Institute of Physics, Bhubaneswar, International School and Conference on Quantum Information

2. Prof. Jayanta Mukhopadhyay Telemedicine Experience in West Bengal and Tripura (Delhi)

3. Prof. Jayanta Mukhopadhyay Image processing in the DCT domain (Department of Electrical Engineering, University of Southern California, Los Angeles, USA)

4. Prof. Jayanta Mukhopadhyay Trajectory Analysis of Broadcast Soccer Videos (Department of Computer Science & Engineering, University of Southern California, Los Angeles, USA)

5. Prof. Jayanta Mukhopadhyay Image processing in the block DCT space (Hyderabad)

6. Prof. Jayanta Mukhopadhyay Video Conferencing: Fundamentals and Applications (Netaji Subhas Open University, Kolkata)

7. Prof. Jayanta Mukhopadhyay Trajectory Analysis of Broadcast Soccer Videos (DAIIT, Gandhinagar)

8. Prof. Partha Pratim Chakrabarti Design and Implementation Validation of Embedded System Applications (NIT Durgapur)

9. Prof. Partha Pratim Chakrabarti Education and Research Opportunities (Bannari Amman Institute of Technology)

10. Prof. Partha Pratim Chakrabarti Challenges in Information Assurance (New Delhi)

11. Prof. Rajeev Kumar Virtual Execution Environments (National Institute of Technology, Rourkela)

12. Prof. Rajeev Kumar Programming Pearls and Pitfalls (Jaypee Institute of Information Technology University, Noida)

13. Prof. Pallab Dasgupta Verifiable Methods for Integrating Power
14. Prof. Pallab Dasgupta
   Management ICs (NSVL Distinguished Professor Lecture, National Semiconductors, Santa Clara, California)
   Model Driven Integration: Putting together the bits and pieces of verification (DVM'2008 (Keynote Address), Bangalore, India)

15. Prof. Dipanwita Roychowdhury
   New Paradigm of the Design of Block Cipher (SAG, New Delhi, DRDO)

16. Prof. Dipanwita Roychowdhury
   Design and Analysis of N X K S-box (National Workshop on Cryptology, Coimbatore)

17. Prof. Sudeshna Sarkar
   Examples of paradigms and rules for handling Bengali and Hindi computational morphology (TCS NLP Winter School 2008, Hyderabad)

THESES (Doctoral and MS)

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Devshri Roy</td>
<td>Automatic Annotation of Learning Materials for E-Learning</td>
</tr>
<tr>
<td>2</td>
<td>Philip Samuel</td>
<td>Automatic Test Case Design using UML Behavioral Models</td>
</tr>
<tr>
<td>3</td>
<td>Debdeep Mukhopadhyay</td>
<td>Design and Analysis of Cellular Automata Based Cryptographic Algorithms</td>
</tr>
<tr>
<td>4</td>
<td>Tathagata Rai Dastidar</td>
<td>New methods for Automated Synthesis and Verification of Analog Circuits</td>
</tr>
<tr>
<td>5</td>
<td>Hemanta Kumar Pati</td>
<td>Reservation and Admission Control for QOS provisioning in Mobile Networks</td>
</tr>
<tr>
<td>6</td>
<td>A Vadivel</td>
<td>Content-based Image and Video Retrieval using the properties of the HSV color space</td>
</tr>
<tr>
<td>7</td>
<td>Suman Kundu :</td>
<td>Patient Management in Wireless Environment using Handheld Devices</td>
</tr>
<tr>
<td>8</td>
<td>Sanjay Chatterjee</td>
<td>Algorithms for post compilation power optimization in Embedded Processors</td>
</tr>
<tr>
<td>9</td>
<td>Roshni Chatterjee</td>
<td>Cryptographic Hash Algorithms: Some Issues and Approaches</td>
</tr>
<tr>
<td>10</td>
<td>Anirban Lahiri</td>
<td>Battery aware Embedded Systems Design through Scheduling and Code-Partitioning</td>
</tr>
<tr>
<td>11</td>
<td>Anupam Chakraborty</td>
<td>Evolutionary Algorithms for Discovery of Bi-clusters from Gene Expression Data</td>
</tr>
<tr>
<td>12</td>
<td>Soumyajit Dey</td>
<td>Embedded Architectures for Speech and Machine Learning: A Design Space Exploration Approach</td>
</tr>
</tbody>
</table>

LAURELS & DISTINCTIONS

1. Dr. Chittaranjan Mandal
   ADCOM 2007, Best Student Paper Award; received by scholar for jointly authored paper
2. Dr. Chittaranjan Mandal  
   Best Paper Award in Sensorware 2007
3. Prof. Pallab Dasgupta  
   IBM Faculty Award
4. Dr. Chittaranjan Mandal  
   IEEE APCCAS 2006, Best Paper Award (1 of 7 BPAs)
5. Prof. Partha Pratim Chakrabarti  
   INAE Visveswarya Chair Professor
6. Dr. Chittaranjan Mandal  
   Industrial Fellow (Honorary), Kingston University, UK
7. Prof. Anupam Basu  
   National Award for Best Technology Innovation for the Physically Disabled, Ministry of Social Justice and Empowerment
8. Prof. Rajeev Kumar  
   Fellow - Indian National Academy of Engineering
DEPARTMENT OF ELECTRICAL ENGINEERING

HEAD: Professor Avinash Kumar Sinha

FACULTY

Professor:

Bandopadhyay, Soumitro
Barua, Alok
Basu, Tapan Kumar
Bhattacharya, Tapas Kumar
Das, Debapriya
Das, Sarit Kumar
Dutta, Pranab Kumar
Kishore, N. K.
Mohan, Bosukonda Murali
Mukhopadhyay, Siddharta
Pal, Jayanta
Patra, Amit
Ray, Goshaidas
Sen Gupta, Sabyasachi
Sen, Siddhartha
Sinha, Avinash Kumar

Ph.D.(IIT Delhi), Nonlinear Dynamics
Ph.D.(IIT Kharagpur), Instrumentation, VLSI
Ph.D.(IIT Delhi), Power Systems, DSP, Speech Processing
Ph.D.(IIT Kharagpur), Electrical Machines & drives, Circuits, Electromagnetics, LIM., Transformer, Inrush current minimization
Ph.D.(IIT Delhi), Power System Engineering
Ph.D.(IIT Kharagpur), Control Systems
Ph.D.(IIT Kharagpur), Signal Processing, Instrumentation, Image processing
Ph.D.(IISc. Bangalore), Applications of High Voltages, High Voltage & Insulation Engineering, Condition monitoring of Power Apparatus
Ph.D.(IIT Kharagpur), Control Systems
Ph.D.(IIT Kharagpur), CAD and Testing of Mixed Signal VLSI, Instrumentation, Control and Automation, Estimation, Monitoring and Diagnosis, Aerospace Control, Tracking and Guidance
Ph.D.(IIT Roorkee), Control System, Power System
Ph.D.(IIT Kharagpur), Control Systems, Power Electronics
Ph.D.(IIT Delhi), Control System Engineering
Ph.D.(IIT Kharagpur), Machine Drives and Power Electronics
Ph.D.(IIT Kharagpur), Instrumentation, Control Systems
Ph.D.(Pilani), Power Systems Engineering

Associate Professor:

Chakraborty, Chandan
Kastha, Deoprasad
Maka, Srinivasu
Pradhan, Ashok Kumar
Routray, Aurobinda

Ph.D.(IIT Kharagpur), Ph.D. (Japan), Machines, Drives and Power Electronics
Ph.D.(Tennessee), Machine Drives and Power Electronics
Ph.D.(IIT Kharagpur), Control Systems, Instrumentation Engineering, Biomedical Engineering
Ph.D. (Sambalpur University), Power System Relaying, Power Quality, Digital Signal Processing
Ph.D.(Sambalpur University), Real Time DSP Algorithms, Intelligent Signal Processing, Real Time Embedded Systems

Assistant Professor:
Chatterjee, Dheeman  Ph.D. (IIT Kanpur), Power Systems Dynamics, FACTS
Chattopadhyay, Souvik  Ph.D. (IISc. Bangalore), Power Electronics
Deb, Alok Kanti  Ph.D. (IIT Delhi), Computational Intelligence, Control Systems
Mukherjee, Anirban  Ph.D. (IIT Kharagpur), Instrumentation
Poddar, Gautam  Ph.D. (IISc. Bangalore), Power Electronics and Drives
Sahoo, Nirod Chandra  Ph.D. (University of Singapore), Power System Operation and Control, Applied Soft Computing

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Faculty Appointment:

Dr. Alok Kanti Deb  Assistant Professor
Dr. Dheeman Chatterjee  Assistant Professor

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities:

From classical to modern, from milli watts to thousands of Mega 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 optimization; 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; 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**:

This Department has identified three thrust areas viz.
(i) Efficient power converters and drives,
(ii) Embedded sensors and systems and
(iii) Microgrids and renewable energy

Other cutting edge technologies where the faculty members are working are – MEMS; VLSI applications in power converters; Automotive electronics and electric vehicles; Non-conventional energy; Control of aerospace systems; Bifurcation and chaos; Fault tolerant and embedded system; Distributed generation; FACTS; Prognosis & diagnosis of catastrophic failures in power systems.

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects**:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Analytical &amp; Computational Evaluation of Various parameters involved in the design of SC Cables (CIC) type to be used for Fusion Grade magnets</td>
<td>BRFS</td>
<td>Rs. 42.70 Lakhs</td>
</tr>
<tr>
<td>2.</td>
<td>Application of Chaos in DC/DC Converters for Reduction of EMI</td>
<td>ISRO</td>
<td>Rs. 8.60 Lakhs</td>
</tr>
<tr>
<td>3.</td>
<td>Artificial Heart Development Program</td>
<td>DST, New Delhi</td>
<td>Rs. 8.16 Lakhs</td>
</tr>
<tr>
<td>4.</td>
<td>Attitude control of launch vehicles</td>
<td>IIT Kharagpur Cell</td>
<td>Rs. 3.00 Lakhs</td>
</tr>
<tr>
<td>5.</td>
<td>AVLSI Consortium</td>
<td>Multiple Organizations in India and Abroad</td>
<td>Rs. 100.00 Lakhs</td>
</tr>
<tr>
<td>6.</td>
<td>Cultural Dimension in Digital Multimedia Security Technology</td>
<td>EU-India Cross cultutal program, New Delhi</td>
<td>Rs. 35.00 Lakhs</td>
</tr>
<tr>
<td>7.</td>
<td>Design &amp; Development of Spark Plasma Sintering facility for Nanomaterial Compaction</td>
<td>MHRD, New Delhi</td>
<td>Rs. 20.00 Lakhs</td>
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<tr>
<td>8.</td>
<td>Design of algorithm target for an embedded redundancy management system for fault tolerance of an electric</td>
<td>Defence Research and Development Laboratory, Hyderabad</td>
<td>Rs. 4.95 Lakhs</td>
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<tr>
<td>Project Number</td>
<td>Project Title</td>
<td>Implementing Agency</td>
<td>Cost (Lakhs)</td>
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<tr>
<td>----------------</td>
<td>-------------------------------------------------------------------------------</td>
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<tr>
<td>9</td>
<td>Design of an optimal control strategy for GSLV MK3</td>
<td>Indian Space Research Organization</td>
<td>Rs. 2.00</td>
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<tr>
<td>10</td>
<td>Development of decision support tools for secure energy management</td>
<td>Ministry of Power, New Delhi</td>
<td>Rs. 24.00</td>
</tr>
<tr>
<td>11</td>
<td>Development of a Low Cost On-Line Distribution Monitoring Device with Wireless Local Loop Capability</td>
<td>Central Power Research Institute, Bangalore</td>
<td>Rs. 25.44</td>
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<tr>
<td>12</td>
<td>Development of an Automotive Electronics Laboratory</td>
<td>MHRD, New Delhi</td>
<td>Rs. 16.00</td>
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<td>13</td>
<td>Development of an Autonomous Underwater Vehicle</td>
<td>DoD, New Delhi</td>
<td>Rs. 267.00</td>
</tr>
<tr>
<td>14</td>
<td>Development of an Economical Variable Speed Constant Frequency Generation System Suitable for Wind Power Generation</td>
<td>Central Power Research Institute, Bangalore</td>
<td>Rs. 26.00</td>
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<tr>
<td>15</td>
<td>Development of an intelligent, embedded sensor system for measuring thermal, electrical &amp; hydraulic properties of soil</td>
<td>DST, New Delhi</td>
<td>Rs. 15.00</td>
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<tr>
<td>16</td>
<td>Development of Decision Support Tools for Secure Energy Management</td>
<td>Central Power Research Institute, Bangalore</td>
<td>Rs. 24.70</td>
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<tr>
<td>17</td>
<td>Development of Embedded Diagnostics Algorithms for HVAC systems in automobiles</td>
<td>General Motors, USA</td>
<td>Rs. 250.00</td>
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<td>18</td>
<td>Development of MEMS based Capacitive Accelerometer</td>
<td>Department of Information Technology, New Delhi</td>
<td>Rs. 103.00</td>
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<tr>
<td>19</td>
<td>Development of Microscopic Imaging System for Dynamic Study of Fundamental Organisms (Fungus)</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00</td>
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<tr>
<td>20</td>
<td>Development of Real Time Algorithms for Detection of Fatigue in Human Drivers</td>
<td>Ministry of Information Technology, New Delhi</td>
<td>Rs. 21.80</td>
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<tr>
<td>21</td>
<td>Development of roof fall prediction system for underground mines using wireless network</td>
<td>Coal India Ltd.</td>
<td>Rs. 216.98</td>
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<tr>
<td>22</td>
<td>Development of Roof fall prediction system for underground mines using wireless network</td>
<td>Coal India Limited</td>
<td>Rs. 216.98</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Jointly with Mining Engg.)</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Development of Sensors for Gas-Liquid and Liquid-Liquid Flow</td>
<td>MHRD, New Delhi</td>
<td>Rs. 14.00</td>
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<tr>
<td>24</td>
<td>Development of the theory of nonsmooth bifurcations in hybrid dynamical systems</td>
<td>BRNS, DAE</td>
<td>Rs. 7.00</td>
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<td>25</td>
<td>Educational Component of General Motors Collaborative Research Laboratory</td>
<td>General Motors Corporation</td>
<td>Rs. 125.00</td>
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<tr>
<td>26</td>
<td>Full Spectrum Real Time Digital Simulator</td>
<td>C-DAC, Trivandrum</td>
<td>Rs. 5.47</td>
</tr>
</tbody>
</table>
27. National Mission on Power Electronics Technology  
   C-DAC, Thiruvananthapuram  
   Rs. 70.00 Lakhs

28. On-board Diagnostics of Automotive Engines  
   GM-IIT Kharagpur Collaborative Research Laboratory  
   Rs. 500.00 Lakhs

29. Seeker, Radar and INS data fusion and filtering for kinematic state estimation of aerospace targets  
   Ministry of Defense, New Delhi  
   Rs. 24.75 Lakhs

30. Setting up a research and development center for Damodar Valley Corporation at Kolkata (Phase-I)  
   Damodar Valley Corporation  
   Rs. 2132.70 Lakhs (Jointly with Mechanical Engineering)

31. STATCOM with four arm configuration  
   C-DAC, Trivandrum  
   Rs. 4.00 Lakhs

Consultancy Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Development of performance monitoring system for critical stand motors of Rail &amp; Structural Mill, Bhilai Steel Plant</td>
<td>RDCIS, Ranchi</td>
<td>Rs. 10.00 Lakhs</td>
</tr>
<tr>
<td>2</td>
<td>Assessment of Dielectric Properties</td>
<td>KE Tex Prembazar Kharagpur</td>
<td>Rs. 0.20 Lakhs</td>
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<tr>
<td>3</td>
<td>Behavioral Modeling and Top-Down Design of Switching Converter ICs</td>
<td>National Semiconductor Corporation, USA</td>
<td>Rs. 50.00 Lakhs</td>
</tr>
<tr>
<td>4</td>
<td>Behavioral modeling and Verification of Analog and Mixed Signal Designs</td>
<td>National Semiconductor Corporation, USA</td>
<td>Rs. 50.00 Lakhs</td>
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<tr>
<td>5</td>
<td>Behavioral Modeling of Power Converters</td>
<td>National Semiconductor Corporation, USA</td>
<td>Rs. 60.00 Lakhs</td>
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<tr>
<td>6</td>
<td>Bus Paralleling Controller with CAN Interface</td>
<td>C-DAC, Trivandrum</td>
<td>Rs. 1.50 Lakhs</td>
</tr>
<tr>
<td>7</td>
<td>Design and Development of a Twenty MegaHertz Switcher</td>
<td>National Semiconductor Corporation</td>
<td>Rs. 8.00 Lakhs</td>
</tr>
<tr>
<td>8</td>
<td>Development of a Substation Automation System Phase I (Monitoring)</td>
<td>DVC</td>
<td>Rs. 25.70 Lakhs</td>
</tr>
<tr>
<td>9</td>
<td>Development of Online Surface Inspection System for Hot Rolled flat Products</td>
<td>RDCIS, SAIL</td>
<td>Rs. 10.00 Lakhs</td>
</tr>
<tr>
<td>10</td>
<td>Development of Parameterized Templates and R-extraction Tools - Phase II</td>
<td>National Semiconductor Corporation, USA</td>
<td>Rs. 90.00 Lakhs</td>
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<tr>
<td>11</td>
<td>Electronic paralleling of UPS System</td>
<td>C-DAC, Trivandrum</td>
<td>Rs. 10.00 Lakhs</td>
</tr>
</tbody>
</table>
12. Impulse Test on 2500 kVA 0.415/11 kV
M/s Synergy Power Eqpt. Pvt. Ltd., Jamshedpur
Rs. 0.35 Lakhs

13. Impulse Test on 5 MVA 33/11 kV Transformer
Marsons Ltd., Kolkata
Rs. 0.85 Lakhs

14. Impulse Test on 6.3 MVA 33/11 kV Transformer
Marsons Ltd., Kolkata
Rs. 0.80 Lakhs

15. Impulse Test on 630 kVA, 11/433 KV Transformer
A. P. Electricals Pvt. Ltd., Kolkata
Rs. 0.35 Lakhs

16. Macro-Modelling of Operational Amplifiers
National Semiconductor Corporation, USA
Rs. 60.00 Lakhs

17. Process Monitoring of Rolling Process at RSM, BSP, SAIL
SAIL R&D, Ranchi
Rs. 5.00 Lakhs

18. Remedial Measures to Mitigate Voltage Dip Problem at CTPS Bus
Damodar Valley Corporation
Rs. 3.15 Lakhs

19. Series compensator for six step inverter
Veeral Control Pvt. Ltd., India, Bhabha Atomic Research Centre (BARC), India
Rs. 1.00 Lakhs

VISITS ABROAD BY FACULTY MEMBER

1. Prof. Soumitro Bandopadhyay
Research collaboration (Newcastle University, UK) One month

2. Prof. Soumitro Bandopadhyay
Collaborative research (Beijing University of Aeronautics & Astronautics, China) 3 weeks

3. Prof. N. K. Kishore
To attend IIICIIS 2007 (University of Peradeniya, Kandy, Sri Lanka) August 6-10

4. Prof. N. K. Kishore
To attend IEEE CEIDP 2007, visit UBC & BC Hydro (Vancouver Canada) October 14-17

5. Dr. Ashok Kumar Pradhan
Research (McGill University, Montreal, Canada) 10 months

6. Dr. Aurobinda Routray
IEEE International Conference on Industrial Information Technology (Vienna, Austria) 7 days

7. Dr. Chandan Chakraborty
To organize a special session and to attend IEEE IECON 2007 conference and ADCOM meeting. (Taipei, Taiwan) November 5-9, 2007

8. Prof. Siddhartha Mukhopadhyay
Project related Meetings (National Semiconductor, USA) 2 weeks

9. Prof. Murali Mohan Bosukonda
To present a paper in an international conference (Sri Lanka) 6 days

INVITED LECTURES BY FACULTY MEMBERS

1. Dr. Nirod Chandra Sahoo
Solving Shortest Path Problem using Particle Swarm Optimization and Noising
2. Dr. Nirod Chandra Sahoo
   Torque Control of Switched Reluctance Motor using a Fuzzy System Based Scheme (Distinguished Lecture Program and National Workshop – Sponsored by INAE) (ITER, Bhubaneswar)

3. Prof. N. K. Kishore
   Industrial Applications of HVE (NIT Durgapur)

4. Prof. N. K. Kishore
   DSM & Distribution Reforms, Electrical Safety at High Voltages (Jyothishmati Institute of Science & Technology, Karimnagar, AP)

5. Prof. N. K. Kishore
   Lightning Overview (CVR College, Hyderabad)

6. Prof. N. K. Kishore
   Introduction to GIS (KLC College of Engineering, near Vijayawada)

7. Prof. N. K. Kishore
   DSM & Distribution Reforms, Lightning, Electrical Insulation in Power Apparatus and Nanodielectrics (Mother Teresa Institute of Science & Technology, Sattupally, Khammam, AP)

8. Prof. N. K. Kishore
   Introduction to GIS (IEEE Kharagpur Section)

9. Prof. N. K. Kishore
   Protection of Power System Elements (DVC Towers, Calcutta)

10. Dr. Chandan Chakraborty
    Induction Motor Drives: Vector Control & Beyond (NIT, Durgapur)

11. Dr. Aurobinda Routray
    Real Time Power Signal Processing (IIT Kanpur)

12. Prof. Siddhartha Mukhopadhyay
    Towards a Semi-Automated Environment for Design and Testing of Analog and Mixed Signal Circuits with (NSVL Distinguished Lecture) (National Semiconductor Corporation, Santa Clara, USA)

13. Prof. Siddhartha Mukhopadhyay
    Sensing Beyond Sensors: Intelligent Virtual Sensing (C-DAC, Thiruvananthapuram)

14. Prof. Siddhartha Mukhopadhyay
    Fault Diagnosis with Discrete Event Models: Theory for the User (General Motors India Science Lab, Bangalore)

15. Prof. Jayanta Pal
    Simulation and Control of Large Scale Systems Using Reduced Order Models (Shri Vishnu Engineering College for Women, Vishnupur, Bhimavaram, Andhra Pradesh)

**LECTURE BY VISITING EXPERT**

1. Dr. Pinaki Ghosh
   Intellectual property with case studies in electronics and electrical sciences
2. Prof. Sivaji Chakravorti  
   Modern tools for impulse fault diagnosis in transformers

3. Prof. Ian Hiskens  
   Practical computational tools for hybrid dynamical systems

4. Prof. Sakti Pramanik  
   Bioinformatics: from genome sequencing to tree of life

5. Prof. S. S. Bhattacharyya  
   Dataflow transformations in high-level DSP system design

6. Dr. A. T. Kalghatgi  
   Trends in nanotechnology-nano electronics & sensors

7. Prof. J. Amarnath  
   Particle movement in gas insulated systems

8. Dr. M. Joy Thomas  
   Condition monitoring of gas insulated systems

9. Dr. B. P. Singh  
   Medium voltage gas insulated systems

10. Dr. B. Hemalatha  
    Dielectric spectroscopy gas insulated systems

11. Dr. Joydeep Mitra  
    Secure power delivery through autonomous microgrids

12. Ms. Vartica Singh  
    Numerical solutions of takagi-Sugeno fuzzy model state equations via block pulse functions

13. Prof. V. Ramanarayanan  
    Linear electromagnetic stirrer for metallurgical applications

14. Prof. Bhim Singh  
    Power quality improvements

**THESES (Doctoral and MS)**

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Partha Sarathi Bera</td>
<td>On Some Aspects of Dynamic Stability of Power Systems</td>
</tr>
<tr>
<td>2</td>
<td>Leena, G.</td>
<td>Design of Controllers for Multivariable Systems</td>
</tr>
<tr>
<td>3</td>
<td>Suvajit Mukherjee</td>
<td>Medium Voltage Squirrel Cage Induction Motor Drives using Three-level Neutral Point Clamped Inverter Modules</td>
</tr>
<tr>
<td>4</td>
<td>H. N. Nagaraja</td>
<td>Efficiency Improvement of Multiphase Synchronous Buck Converter with Coupled Inductor Topology</td>
</tr>
<tr>
<td>5</td>
<td>Suvarun Dalapati</td>
<td>Power Converters based on Controlled Capacitor Charging Technique</td>
</tr>
<tr>
<td>6</td>
<td>Pradipta Patra</td>
<td>Design and On-Chip Implementation of a Single-Inductor Triple-output DC-DC Buck Converter</td>
</tr>
<tr>
<td>7</td>
<td>Prabir Saha</td>
<td>Design of Low Phase Noise Low Power CMOS Quadrature Voltage Controlled Oscillator</td>
</tr>
<tr>
<td>8</td>
<td>Samrat Ray</td>
<td>A Hierarchical Approach to Resistance Extraction of Power Arrays</td>
</tr>
<tr>
<td>9</td>
<td>Rajarshi Paul</td>
<td>Design of a 20MHz Switching Voltage Regulator IC with a Precision Voltage Reference</td>
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<tr>
<td>10</td>
<td>Siddartha Swarnakar</td>
<td>Development of a Fault Tolerant BLDC drive for aerospace actuators</td>
</tr>
</tbody>
</table>
BOOK PUBLISHED

# Name of the Author(s) | Title | Publisher | Year
---|---|---|---

PATENTS GRANTED

1. An Instrumentation System For Measurement of Velocity of Solid, Liquid and Gaseous Materials in Two Phase Flows
2. A Pumping System for Increasing Pressure of Blood or a fluid in a Controlled and Stepwise Mode
3. Visible Wavelength Laser Diode Based Diameter Gauge

LAURELS & DISTINCTIONS

1. Prof. Pranab Kumar Dutta Certificate of Merit by Institution of Engineers (India)
2. Prof. Pranab Kumar Dutta ISTE best M.Tech. thesis award
3. Prof. Soumitro Bandopadhyay Fellow of the Indian National Science Academy (INSA)
4. Prof. Amit Patra Winner of Cadence Design Contest
5. Prof. Siddhartha Mukhopadhyay Editorial Board Member, Journal of Systems Science & Engineering
6. Prof. Siddhartha Mukhopadhyay Honorary Editor, Controls, IETE Journal of Research
7. Prof. Siddhartha Sen Editor, Journal of Systems Science and Engineering, Published by Systems Society of India
8. Prof. Siddhartha Sen Associate Editor, International Journal on Smart Sensing and Intelligent Systems
9. Prof. Avinask K. Sinha Editorial Board Member, ICFAI Journal of Science and Technology, Published by ICFAI University Press
10. Dr. Chandan Chakraborty Editorial Board Member, IET Power Electronics (UK)
11. Dr. Chandan Chakraborty Editorial Board Member, IEEE Industrial Electronics Magazine
12. Dr. Ashok K. Pradhan Editorial Board Member, International Journal of Power and Energy Conversion (IJPEC), Published by Inder Science
DEPARTMENT OF ELECTRONICS & ELECTRICAL COMMUNICATION ENGINEERING

HEAD: Professor Ajay Chakraborty

FACULTY

Professor:

Banerjee, Swapna Ph.D.(IIT Kharagpur), Microelectronics & VLSI Design
Biswas, Dhrubes Ph.D.(Illinois, USA)
Biswas, Prabir Kumar Ph.D.(IIT Kharagpur), Image and Video Processing, Computer Engineering
Chakraborty, Ajoy Ph.D.(IIT Kharagpur), Electromagnetics, EMI/EMC, Array Antenna, Computational Techniques
Chakraborty, Mrityunjoy VLSI for Signal Processing, Signal Processing for Wireless Communication
Datta, Debasish Ph.D.(IIT Kharagpur), Telecommunications
Garg, Ramesh Ph.D.(IIT Kanpur), Microwave and RF Engineering
Maiti, Chinmay Kumar Ph.D.(IIT Kharagpur), Microelectronics (Si Heterostructures)
Pathak, Sant Sharan Ph.D.(IIT Delhi), Digital Communication
Rajakumar, Ratnam Ph.D.(IIT Kharagpur), Digital Signal Processing, Communication Systems
Ray, Ajoy Kumar Ph.D.(IIT Kharagpur), Image Processing, Pattern Recognition, Soft computing
Sanyal, Subrata Ph.D.(IIT Kharagpur), RF & Microwave Engineering, E.M.Scatte
Sen Gupta, Somnath Ph.D.(IIT Bombay), Image Processing and Computer Vision

Associate Professor:

Chakrabarti, Indrajit Ph.D. (IIT Kharagpur), VLSI Design
Chattopadhyay, Santanu Ph.D.(IIT Kharagpur), VLSI, Low power design, Testing
Dhar, Anindya Sundar Ph.D.(IIT Kharagpur), Microelectronics and VLSI Design

Assistant Professor:

Bhattacharya, Amitabha Ph.D.(IIT Kharagpur), Microwave Communication
Bhattacharyya, Tarun Kanti Ph.D. (Jadavpur University), Microelectronics and VLSI
Chakraborty, Paritosh Kumar Ph.D. (IIT Kharagpur), Solid State Science & Technology
Datta, Raja Ph.D.(IIT Kharagpur), Computer Networks, Distributed Processing, Algorithms
Ghosh, Bratin Ph.D.(University of Manitoba), Microwave Engineering
Mahapatra, Sudipta Ph.D.(IIT Kharagpur), Computer Engineering
Mandal, Pradip Ph.D.(IISc. Bangalore), CAD for CMOS analog VLSI,
Analog circuit design

Mukhopadhyay, Sudipta Ph.D. (IIT Kanpur), Visual Information Processing
Roy, Rajarshi Ph.D. (Brooklyn University), Telecommunication Systems and Networks, Queuing theory, Stochastic Optimization
Roy, Rajat Ph.D. (University of Mumbai), Microwaves
Saha, Goutam Ph.D.(IIT Kharagpur), Signal Processing, Modelling & Prediction

Scientific Officer:

Sahoo, Ghanashyam Ph.D. (Jadavpur University), EMI, EMC, Microwave & Antenna

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities:

3. **Wireless Networks**: Development of secure routing protocols in Mobile ad-hoc networks (MANET), Development of addressing schemes for secure ad-hoc networks, Development of improved routing protocols for sensor actuator networks (SANET).
4. **Optical Networks**: Design of Survivable Wavelength Division Multiplexing (WDM) networks for Dynamic Requests.
5. **Speech Processing**: Speech Enhancement, Speaker Recognition, Speech Recognition; Biomedical Signal Processing, Heart Sound, Lung Sound, Neuro-signal (EEG, MEG etc.) Analysis
6. **Design of efficient hardware architectures for motion estimation and turbo-decoder.**
7. **Efficient hardware architectures for motion estimation (used in video compression) and turbo-decoder (used in forward error correction in communication)**

Thrust Areas:

1. Microelectronics
2. Wireless Communication

New Acquisitions:

The Telecom-Networks Laboratory has been developed in the Department of Electronics & Electrical Communication Engineering, by the Department of Science & Technology, Government of India, under the FIST program. A number of new equipments have been procured for doing communication-networking related experiments. Equipments like CISCO
Routers, Switches, Wireless Access Points, Network Terminal NT-B have been used to set-up experiments to give a first hand idea about how routing is done in communication networks. Ericsson Advanced Digital ISDN ready EPABX system along with ISDN phones are used for ISDN set-up. A Video Conferencing system has also been procured to set up a video conference experiment under the Lab. A number of servers like Sun Fire V215 and Wipro Netpower have been procured to facilitate the communication related experiments. The lab is also equipped with Falcon Mobile Telephony Communication Trainer and Benchmark LAN-Trainer

ON-GOING RESEARCH PROJECTS

Sponsored Projects :

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
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<tbody>
<tr>
<td>1.</td>
<td>Design of High Speed and / or Low Power Adaptive Decision Feedback Equalizer – an Architectural Optimization Approach</td>
<td>MIT, New Delhi</td>
<td>Rs. 30.40 Lakhs</td>
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<td>2.</td>
<td>Content based Image Retrieval for medical Images</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
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<td>3.</td>
<td>Lossless Image Compression of Satellite Images</td>
<td>IIT Kharagpur</td>
<td>Rs. 0.50 Lakhs</td>
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<td>4.</td>
<td>Development of Traditional Tongue Based Diagnostic Software Through Grabbing and Processing of Tongue Images for Storage, Retrieval and Rule Generatio</td>
<td>DST, New Delhi</td>
<td>Rs. 6.02 Lakhs</td>
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<tr>
<td>5.</td>
<td>Design of a Hardware Accelerator for Gabor Filter Bank Based Image Processor and its Implementation on FPGA</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
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<tr>
<td>6.</td>
<td>Design and Development of Secure Routing protocols for Mobile Ad-hoc Networks</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
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<td>7.</td>
<td>Complex Biomedical Analysis</td>
<td>DST, New Delhi</td>
<td>Rs. 7.00 Lakhs</td>
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<td>8.</td>
<td>Development of speaker recognition software for telephone speech</td>
<td>ISRO, Bangalore</td>
<td>Rs. 10.00 Lakhs</td>
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<td>9.</td>
<td>Development of a speaker recognition chip Phase-I : FPGA implementation</td>
<td>AVLSI Consortium</td>
<td>Rs. 5.00 Lakhs</td>
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</table>

Consultancy Projects :

<table>
<thead>
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<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Real Time Image Processing Algorithm Development for Conveyor Belt Health Monitoring</td>
<td>Phoenix Conveyor Belt Systems, Germany</td>
<td>Rs. 22.00 Lakhs</td>
</tr>
</tbody>
</table>

VISITS ABROAD BY FACULTY MEMBER

1. Prof. Mrityunjoy Chakraborty Visiting Professor at the City University of Hong Kong
2. Prof. Mrityunjoy Chakraborty Invited to an academic leaders’ summit on formation of an asia-pacific signal processing society at the Tokyo Institute of Technology, Tokyo, Japan

3. Prof. Mrityunjoy Chakraborty Visiting Professor at the Kyoto University (2 weeks)

4. Prof. Mrityunjoy Chakraborty Presented paper at the IEEE ISCAS-2008 at Seattle, USA and also attended editorial board meeting of the IEEE Transactions Circuits and Systems, Part II

5. Dr. Santanu Chattopadhyay Asian Test Symposium, October 8-11, 2007, Beijing China IEEE Workshop on RTL and High Level Testing, October 12-13, Beijing, China

6. Prof. Swapna Banerjee Presented paper at the IEEE ISCAS-2008 at Seattle, USA

**INVITED LECTURES BY FACULTY MEMBERS**

1. Prof. Mrityunjoy Chakraborty “VLSI Digital Signal Processing”, (S. T. Microelectronics, Greater Noida, UP)

2. Dr. Sudipta Mukhopadhyay “Wavelet Transform” (International Conference on Statistical Paradigms - Recent Advances and Reconciliations. ICSPRAR-2008, January 01-04, 2008) (Kolkata, India)

3. Dr. Raja Datta Optical WDM : Solution for Next Generation Networks. (Workshop on Physics and Technology of All-Optical Communication Components and Devices, October 16, 2007) (IIT Kharagpur)

4. Dr. Raja Datta Wavelength Division Multiplexed Networks and Generalized Multi-protocol Label Switching. (Communication Seminar, March 18, March 2008) (Indian Air Force Station, Salua)

**LECTURE BY VISITING EXPERT**

1. Prof. S. S. Bhattacharyya Dataflow Transformations in High-level DSP System Design
   Department of Electrical and Computer Engineering
   University of Maryland at College Park, USA

2. Prof. Keshab K. Parhi Biomedical Signal Processing
   Department of Electrical and Computer Engineering
   University of Minnesota, MN, USA
### THESES (Doctoral and MS)

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rajarshi Mahapatra</td>
<td>Studies on Link-Adaptive Wireless Communications</td>
</tr>
<tr>
<td>2</td>
<td>Sushrut Das</td>
<td>Analysis of Rectangular Waveguide Based Passive Devices and Antennas Using Multiple Cavity Modeling Technique</td>
</tr>
<tr>
<td>3</td>
<td>Paramesha</td>
<td>Estimation of Error Induced in the Near Field due to Measuring Probe</td>
</tr>
<tr>
<td>4</td>
<td>Kolekar Maheshkumar Hanmant</td>
<td>Automated Semantic Concept Extraction and Highlight Generation of Sports Video Sequences</td>
</tr>
<tr>
<td>5</td>
<td>Anirban Das</td>
<td>Lifting Based Architectures for Realizing 2 and 3 Dimensional Discrete Wavelet Transform</td>
</tr>
<tr>
<td>6</td>
<td>Sanjoy Kumar Dey</td>
<td>Design of an 8-bit 2.5 GSPS A/D Converter using 0.25 μm Si/SiGe BiCMOS Technology</td>
</tr>
<tr>
<td>7</td>
<td>Arindrajit Ghosh</td>
<td>Design of a Low Power 8-Bit 200-MSPS A/D Converter</td>
</tr>
<tr>
<td>8</td>
<td>Ravi Shankar Prasad</td>
<td>Design of High Speed Digital to Analog Converter</td>
</tr>
<tr>
<td>9</td>
<td>Manabendra Maji</td>
<td>Knowledge-Based Expert System for Doppler Ultrasonography Spectrogram</td>
</tr>
<tr>
<td>10</td>
<td>Pralay Mandal</td>
<td>An Approach to Non-Invasive Blood Glucose Detection</td>
</tr>
<tr>
<td>11</td>
<td>Debasish Paul</td>
<td>Design &amp; Fabrication of Silicon based Microstructure for Tunneling Application to MEMS</td>
</tr>
<tr>
<td>12</td>
<td>Rajarshi Bhattacharya</td>
<td>Frequency Domain Identification of Linear Distributed RF Systems by Particle Swarm Optimization</td>
</tr>
<tr>
<td>13</td>
<td>Debasis Sarkar</td>
<td>Region-of-Interest Based Video Coding for Low Bitrate Applications</td>
</tr>
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</table>

### BOOK PUBLISHED

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the Author(s)</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Prof. C. K. Maity</td>
<td>Selected Works of Professor Herbert Kroemer</td>
<td>World Scientific, Singapore</td>
<td>2008</td>
</tr>
</tbody>
</table>

### PATENTS GRANTED
   An integrated system to acquire and process digital heart sound signal for identification of valvular heart diseases with training, self-test, report generation and display facilities

LAURELS & DISTINCTIONS

1. Prof. Mrityunjoy Chakraborty
   Invited to join the editorial boards of the IEEE Transactions on Circuits and Systems, Part I (2007) and Part II (2008) as Associate Editor

2. Prof. Mrityunjoy Chakraborty
   Invited as a guest editor of a special issue of the EURASIP JASP on Distributed Space Time Processing

3. Prof. Mrityunjoy Chakraborty
   Invited as TPC member of the IEEE International conf. on communications, 2007 (Glasgow), 2008 (Beijing) and IEEE Globecom (2008)

4. Dr. Sudipta Mukhopadhyay
   Honorary Member of the Editorial Board of the International Journal of BioSciences and Technology

5. Prof. P. K. Biswas
   Member, Editorial Board: International Journal on Medical Engineering and Informatics, Published by Inderscience Publication (2007)

6. Dr. Raja Datta
   Honorary Member of the Editorial Board of the International Journal of BioSciences and Technology

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

1. VLSI Signal Processing
2. Conference on Advances in Space Science and Technology
3. INDAC’08 at IIT Kharagpur
5. Instruction Enhancement Program (IEP) on “Technology CAD” under Special Manpower Project, Sponsored by the Ministry of Communication and Information Technology was held at IIT Kharagpur
DEPARTMENT OF GEOLOGY & GEOPHYSICS

HEAD : Professor Anil Kumar Gupta

FACULTY

Professor :

Bhattacharya, Abhijit Ph.D. (IIT Kharagpur), Metamorphic Petrology, Igneous Petrology
Das, Subhasish Ph.D. (IIT Kharagpur), Sedimentology, Basin Tectonics
Gupta, Anil Kumar Ph.D. (Benaras Hindu University), Palaeoclimatology, Marine Micropaleontology, Marine Geology
Mishra, Biswajit Ph.D. (IIT Kharagpur), Ore Geology & Metaorphic Petrology
Sarkar, Anindya Ph.D. (Gujarat), Sedimentology, Isotope Geochemistry, Palaeoclimatology, Geochronology
Nath, Sankar Kumar Ph.D. (IIT Kharagpur), Earthquake Seismology, Geophysical Tomography, Mathematical Geophysics, Geophysical Signal Processing
Sengupta, Debasish Ph.D. (Gujarat), Nuclear Geophysics, Environmental Radioactivity
Tripathy, Subhasish Ph.D. (IIT Bombay), Environmental Geochemistry

Associate Professor :

Bhowmik, Santanu Kumar Ph.D. (Jadavpur University), Metamorphic Petrology, Geochemistry, Igneous Petrology
Gupta, Saibal Ph.D. (Cantab), Structural Geology, Metamorphic Petrology, Tectonics
Mamtani, Manish A Ph.D. (MS University), Structural Geology, Microtectonics
Panigrahi, Mruganka Ph.D. (IIT Kharagpur), Economic Geology, Computer Applications
Kumar Sharma, Shashi Prakash Ph.D. (Benaras Hindu University), Electrical and EM Geophysics, Groundwater investigation, Inverse theory

Assistant Professor :

Basu, Arindam Ph.D. (Hong Kong), Engineering Geology, Rock Mechanics
Dalai, Tarun K Ph.D. (PRL), Low temperature geochemistry
Mitra, Supriyo Ph.D. (Cantab), Continental Tectonics, Seismic Tomography, Earthquake Seismology, Lithospheric Structure
Mohanty, William Kumar Ph.D. (Delhi), Seismic Hazard Analysis, Microzonation, Grav. & Mag. Methods of Prospecting
Nair, Rajesh R Ph.D. (NGRI), Geophysics: Signal Processing
Ray, Sanghamitra Ph.D. (Calcutta University), Vertebrate Palaeontology
Sanyal, Prasanta Ph.D. (PRL), Sedimentology, Stable Isotope Geochemistry
Lecturer :

**Dutta Indira**
Ph.D. (IIT Kharagpur), Mathematical Geology, Remote Sensing

Senior Scientific Officer :

**Sengupta, Probal**
Ph.D., Seismology, Seismic Hazard & Microzonation, Seismic Prospecting

**RESEARCH AND DEVELOPMENT**

**Brief descriptions of on-going activities :**

Studies on Indian monsoon (both modern and ancient) and paleoclimate studies of the Indian subcontinent and paleoceanography of the Indian Ocean. Tectonic evolution of craton – mobile belt ensembles in parts of the Indian shield; Emplacement mechanism, tectonic evolution and metallogenesis in Precambrian Granitoids in India; Gold mineralization and gold potentials of the schist belts in Dharwar Craton, India; Studies on Indian microvertebrates, Lithospheric structure across Himalaya, Deformation at Collisional boundaries, 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, Mechanical characterization of rock materials, Groundwater potential assessment and pollution by natural and anthropogenic causes; Waste utilization and wasteland development; Natural radiation hazard estimation

**Thrust Areas :**

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

**New Acquisitions :**

1. PUNDITplus PC1006 digital ultrasonic tester (Institute Grant)
2. CNSFARNELL (AT 241/E) rebound hammer (Institute Grant)

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects :**

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tectonothermal evolution of polycyclic granulite enclaves in amphibolites from the Sandmata complex, Rajasthan</td>
<td>DST, New Delhi</td>
<td>Rs. 13.01 Lakhs</td>
</tr>
</tbody>
</table>
2. Tectono-metamorphic evolution of the Higher Himalayan rocks of Western (Kemeng Corridor) and eastern Arunachal Pradesh: A comparative Study
   DST, New Delhi Rs. 7.42 Lakhs
   DST, New Delhi Rs. 555.00 Lakhs
4. Contrasting Styles Of Exhumation Of Monocyclic And Polycyclic Granulites From The Sausar Mobile Belt In Central India: Constraints From Metamorphic P
   DST, New Delhi Rs. 14.03 Lakhs
5. Investigation of alteration of cosmic dust particles: Implications for interpretation of 187Os/188Os records in marine sediments and estimates for acc
   Department of Space, Govt. of India Rs. 20.00 Lakhs
6. Rhenium-Osmium isotope systematics of organic-rich sediments of the Upper Vindhyan Supergroup: Chronology, interbasinal correlation and records of Osm
   IIT Kharagpur -
7. Decadal Scale variability in the Indian Ocean summer monsoon during the Holocene
   DST, New Delhi Rs. 19.50 Lakhs
8. The exhumation factor in the genesis of inverted metamorphic sequences - an evaluation from structure, metamorphism, fluid inlcusion and earthquakes I
   DST, New Delhi Rs. 14.00 Lakhs
9. Modeling and Monitoring of landslide hazard in Sikkim Himalayas
   DST, New Delhi Rs. 22.10 Lakhs
10. Genetic modeling of orogenic gold deposits in the Dharwar Craton: constraints from metamorphism, ore mineralogy and fluid evolution
    DST, New Delhi Rs. 32.02 Lakhs
11. Investigation of the Deep Seismic Structure in the Foreland of the Himalayan Collision Zone in Eastern India
    IIT Kharagpur Rs. 2.80 Lakhs
12. 3-Dimensional imaging of the lithosphere and active deformation across Sikkim-Darjeeling Himalaya and a comparison with NW-Himalaya (Deep Continental Studies
    DST, New Delhi Rs. 55.00 Lakhs
13. Seismic Hazard Assessment of Haldia, Bengal Basin Area
    DST, New Delhi Rs. 3.12 Lakhs
14. Evaluation of Seismic Potential of Talcher area, Orissa
    IIT Kharagpur Rs. 2.40 Lakhs
<table>
<thead>
<tr>
<th>No.</th>
<th>Project Title</th>
<th>Institution/Organization</th>
<th>Funding Amount</th>
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<tbody>
<tr>
<td>15</td>
<td>Broadband seismometry in the north-east region with special emphasis to Guwahati for seismic hazard assessment</td>
<td>DST, New Delhi</td>
<td>Rs. 10.28 Lakhs</td>
</tr>
<tr>
<td>16</td>
<td>Geochemical and fluid inclusion studies on the Malanjkhand granitoid complex: Implications for ore genesis and crustal evolution</td>
<td>DST, New Delhi</td>
<td>Rs. 10.00 Lakhs</td>
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<tr>
<td>17</td>
<td>Functional morphology and osteohistology of some Triassic reptiles from India</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
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<tr>
<td>18</td>
<td>Carbon isotope studies of graphite and coexisting carbonate in Eastern Ghat, Orissa: implication to the source of graphite and temperature of metamorphism</td>
<td>DST, New Delhi</td>
<td>Rs. 3.00 Lakhs</td>
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<tr>
<td>19</td>
<td>National facility on stable isotope geochemistry, IIT, Kharagpur</td>
<td>DST, New Delhi</td>
<td>Rs. 233.90 Lakhs</td>
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<tr>
<td>20</td>
<td>A comparative structural analysis of Lonar and Ramgarh Craters for observations on impact structures on hard and soft-target rocks, and geochemical an</td>
<td>PLANEX, Physical Research Laboratory, Ahmedabad</td>
<td>Rs. 3.62 Lakhs</td>
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<tr>
<td>21</td>
<td>Natural radioactivity and radiation dosimetry in the high background radiation area along the southern coast of Orissa, India</td>
<td>BRNS, Department of Atomic Energy, Mumbai</td>
<td>Rs. 8.68 Lakhs</td>
</tr>
<tr>
<td>22</td>
<td>Measurement and Modeling of Radon Transport and distribution around tailing pond area and dwellings</td>
<td>BRNS, Department of Atomic Energy, Mumbai</td>
<td>Rs. 17.00 Lakhs</td>
</tr>
<tr>
<td>23</td>
<td>Investigation of the basement structure of the Bengal Basin using Gravity and Seismic data</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
</tr>
<tr>
<td>24</td>
<td>FIST-II</td>
<td>DST, New Delhi</td>
<td>Rs. 260.00 Lakhs</td>
</tr>
<tr>
<td>25</td>
<td>Geophysical survey using gravity and magnetic methods in south Purulia shear zone</td>
<td>DST, New Delhi</td>
<td>Rs. 26.00 Lakhs</td>
</tr>
<tr>
<td>26</td>
<td>Utilization of hyperspectral data in geological investigation / mapping for mineral exploration</td>
<td>Space Aplication Centre, Ahmedabad</td>
<td>Rs. 11.44 Lakhs</td>
</tr>
<tr>
<td>27</td>
<td>Reconstruction of monsoonal rainfall from the late Quaternary Himalayan foreland sediments by Stable Isotope tracers: implications to climate forcing</td>
<td>DST, New Delhi</td>
<td>Rs. 11.00 Lakhs</td>
</tr>
<tr>
<td>28</td>
<td>The relationship between anisotropy of magnetic susceptibility, strength anisotropy and microstructure in rocks devoid of mesoscopic foliations</td>
<td>DST, New Delhi</td>
<td>Rs. 15.93 Lakhs</td>
</tr>
<tr>
<td>29</td>
<td>Global Seismic Monitoring by Broadband Seismological Observatory at IIT Kharagpur</td>
<td>Ministry of Earth Sciences, Govt. of India</td>
<td>Rs. 18.20 Lakhs</td>
</tr>
<tr>
<td>30</td>
<td>Microzonation of Sikkim Region</td>
<td>Ministry of Earth Sciences, Govt. of India</td>
<td>Rs. 42.89 Lakhs</td>
</tr>
</tbody>
</table>
   Ministry of Earth Sciences, Govt. of India
   Rs. 192.60 Lakhs

32. National Capacity Building in Earthquake Engineering (EER)
   Ministry of Home Affairs, Govt. of India
   Rs. 33.26 Lakhs

33. Broadband Seismometry in the North-East region with special emphasis to Guwahati for Seismic hazard assessment
   DST, New Delhi
   Rs. 72.00 Lakhs

34. Broadband Seismological Observatory at IIT Kharagpur for Seismotectonic Study of Bengal Basin
   DST, New Delhi
   Rs. 64.65 Lakhs

35. Isostatic compensation mechanisms of continental regimes based on application of wavelet
   IIT Kharagpur
   Rs. 3.00 Lakhs

36. Coastal sedimentary archives of Tsunami affected Eastern Indian Coast using high resolution Geophysical records
   INCOIS, Hyderabad
   Rs. 40.00 Lakhs

37. Spatio spectral localization of isostatic coherence anisotropy of 90 degree East ridge
   Ministry of Earth Science, Govt. of India
   Rs. 20.00 Lakhs

Consultancy Projects :

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Laser Raman Microspectrometry Analysis</td>
<td>Industry, Academic and Governmental Organizations</td>
<td>Rs. 2.50 Lakhs</td>
</tr>
<tr>
<td>2.</td>
<td>Electrical resistivity survey for delineation of Limestone formation around Chaibasa-Jharkhand</td>
<td>Madras Cement</td>
<td>Rs. 2.5 Lakhs</td>
</tr>
<tr>
<td>3.</td>
<td>Resistivity Survey for installation for deep tube-well at Kharikamathani</td>
<td>PHED, Govt. of West Bengal</td>
<td>Rs. 0.40 Lakhs</td>
</tr>
<tr>
<td>4.</td>
<td>Magnetic Laboratory Maintenance Project</td>
<td>Various Government and Private agencies</td>
<td>Rs. 0.25 Lakhs</td>
</tr>
</tbody>
</table>

VISITS ABROAD BY FACULTY MEMBER

1. Dr. M. A. Mamtani
   Conference on “Deformation Mechanism, Rheology and Tectonics” (Milan, 144, Rendiconti della Societa Geologica Itali)

2. Dr. S. Mitra
   Postdoctoral Fellowship (UK, UK-India Education)
3. Dr. W. K. Mohanty
   Collaborative Research, (University of Trieste &
   International Center for Theoretical Physics,
   Italy) (May 14 to July 29).

4. Dr. M. K Panigrahi
   Collaborative research (Geological Survey of
   Japan, AIST, Tsukuba, Ibaraki, Japan) (Two
   weeks).

INVITED LECTURES BY FACULTY MEMBERS

1. Prof. A. K. Gupta
   Changing face of the Indian summer monsoon
   : Its impact on marine life, vegetation and
   human societies (Physical Research
   Laboratory, Ahmedabad) (January 22-25,
   2008)

2. Prof. A. K Gupta
   Evolution of the Indian Monsoon System
   during the Neogene : Present status and
   Unresolved Issues (BSIP, Lucknow) (November 16-17, 2007)

3. Dr. M. A. Mamtani
   Anisotropy of Magnetic Susceptibility :
   Introduction to Fundamentals (Department of
   Geology, Kerala University, Trivandrum)

4. Dr. M. A. Mamtani
   Graphical Representation of AMS Data
   (Department of Geology, Kerala University,
   Trivandrum)

5. Dr. M. A. Mamtani
   Application of AMS in Structural Geology
   (Examples from Naturally Deformed
   Rocks) (Department of Geology, Kerala
   University, Trivandrum)

6. Dr. W. K. Mohanty
   Geophysical Methods of Prospecting,
   Seismology (Utkal University, Bhubaneswar)
   (March 19-21, 2008)

7. Dr. W. K. Mohanty
   Seismic Hazard Analysis in India (Trident
   Institute, Bhubaneswar) (March 23, 2008)

8. Dr. W. K. Mohanty
   Realistic Modelling of Earthquake Ground
   Motion in mega cities (CSIR Centre for
   Mathematical Modelling and Computer
   Simulation, Bangalore) (March 31 – April 06)

9. Prof. S. K. Nath
   Seismic Microzonation Framework –
   Principles & Case Studies (National Disaster
   Management Authority, Govt. of India at
   Centaur Hotel, New Delhi) (April 2-3, 2007)

10. Prof. S. K. Nath
    Tsunamis at the National Workshop on
    Science and Technology in Disaster
    Management (Earthquake, Land Slide &
    Tsunami) “Session VI – Tsunamis”) (NDMA,

11. Prof. S. K. Nath
    Seismic Microzonation Framework –
    Principles & Applications (Indian Institute of
12. Prof. S. K. Nath
   Earthquake Hazard in the Northeast India – A Computer intensive Seismic Microzonation Approach with (Indian Statistical Institute, Kolkata, INAE Kolkata Chapter) (February 12, 2008)

13. Dr. P. Sanyal
   Origin of Graphite in the Eastern Ghat Mobile Belt : a carbon isotope approach (Goa)

14. Dr. M. K. Panigrahi
   Magmatism, Tectonism and Mineralization (Department of Geology, Kumaon University, Nanital)

LECTURE BY VISITING EXPERT

1. Prof. B. K. Sahu, Department of Earth Sciences, Indian Institute of Technology, Bombay
   “Earth Sciences : Teaching, Research and Development” (November 6, 2007)

2. Dr. A. K. Dubey, WIHG, Dehradun
   “Structural Evolution of the Himalaya” (December 3, 2007)

3. Dr. Alan Collins, The School of Earth & Environmental Sciences, University of Adelaide, Australia
   "The Ediacaran-Cambrian Evolution of the Circum-Indian Orogens" (January 24, 2008)

4. Dr. S. R. Shetye, Director, NIO, Goa
   "An Overview of Physics of Mandovi and Zuari Estuaries in Goa" (January 28, 2008)

THESES (Doctoral and MS)

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
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<tbody>
<tr>
<td>1</td>
<td>Rashmi</td>
<td>Sedimentation Dynamics of the Proterozoic Singhbhum Basin : A perspective from the Bisrampur-Ghatsila-Galudih Region, Eastern India</td>
</tr>
<tr>
<td>2</td>
<td>Indrajit Pal</td>
<td>Seismic Scenario of the Northeast Indian Peninsula</td>
</tr>
<tr>
<td>3</td>
<td>Vikas Chand Baranwal</td>
<td>Integrated Interpretation of VLF Data with other Geophysical Data and Study of Two-Dimensional VLF Modeling and Inversion</td>
</tr>
<tr>
<td>4</td>
<td>Suman Das</td>
<td>P-T-deformation history across the Eastern Ghats Mobile Belt Craton Contact, Indian evidence from the northwestern segment of the belt, and implications</td>
</tr>
</tbody>
</table>

LAURELS & DISTINCTIONS

1. Prof. A. K. Gupta
   Fellow of the Indian Academy of Sciences, Bangalore, 2008

2. Prof. A. K. Gupta
   Life Fellow of the Indian Geophysical Union, Hyderabad, 2008
4. Dr. S. K. Bhowmik  Nominated for INSA-DFG Fellowship for the year 2008-09
5. Dr. M. A. Mamtani  H.H. Read Memorial Gold Medal Award by the Society of Geoscientists and Allied Technologists, Bhubaneswar, 2007
6. Dr. S. Mitra  UK-India Education and Research Initiative (UKIERI) post doctoral Fellowship, 2008
DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

HEAD : Professor Damodar Suar

FACULTY

Professor :

Basu, Partha  Ph.D.(Calcutta), Economics, Econometrics and Mathematical Economics
Chatterjee, Bani  Ph.D.(BHU), Development Planning, Sustainable Development, International Finance
Chatterjee, Suhita Chopra  Ph.D.(IIT Bombay), Sociology of Health and Medicine, Bio-Medical Ethics, Sociology of Architecture
Gera Roy, Anjali  Ph.D.(IIT Bombay), Post-colonial Literatures and Theory, Culture and Media Studies
Mandal, Manas Kumar (on leave)  Ph. D. (Calcutta), Clinical and Social Psychology, Neuropsychology
Srivastava, Kailash Bihari Lal  Ph.D.(IIT Kanpur), Human Resource Development, Organizational Behaviour
Suar, Damodar  Ph.D.(IIT Kharagpur), Social and Organizational Psychology, Neuropsychology
Tewari, Hare Ram  Ph.D.(IIT Kharagpur), Rural and Urban Development, Sociology of Organizations

Associate Professor :

Chakraborti, Chhanda  Ph.D.(Utah, USA), Logic, Philosophy of Mind, Applied Ethics
Giri, Vijai Nath  Ph.D.(IIT Kharagpur), Interpersonal Communication, German Language
Nayak, Narayan Chandra  Ph.D.(Utkal), Agricultural and Rural Economics, Urban Informal Sector and Migration
Patnaik, Priyadarshi  Ph.D.(Utkal), Indian aesthetics, Communication and Media studies

Assistant Professor :

Behera, Bhagirath  Ph.D.(Bonn, Germany), Environmental and Resource Economics, Institutional Economics
Chakraborty, Jayshree  Ph. D. (IIT Kanpur), Theoretical and Applied Linguistics
Das, Saswat Samay  Ph. D. (Utkal), Post-colonial and Post-modern Studies, Indian Writing in English, Culture Studies
Goswami, Kishor  Ph. D.(IIT Kharagpur), Agricultural Economics, Poverty, Gender and Trade
Komalesha, H. S.  Ph. D.(IIT Kharagpur), Postcolonial Studies, Translation Studies, Indian English Literature


Management, Econometrics

Mishra, Pulak  Ph. D. (Vidyasagar), Industrial Economics, Public Finance and Policy, Economics of Rural Development

Mishra, Trupti (on leave)  Ph.D.(IIT Kharagpur), Environmental Economics, Finance and Trade, Industrial Economics

Murugan, Seema  Ph.D. (BHU), African American Literature, Communication Skills, Dalit Literature

Pradhan, Rabindra Kumar  Ph.D. (Utkal), Social and Organizational Psychology, Human Resource Development

Visiting Faculty:

Kapoor, Sucheta  Ph.D. (Oxford), Nineteenth Century French Literature, Cultural Studies

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Faculty Appointment:

Dr. Jayshree Chakraborty  Assistant Professor
Dr. Rabindra Kumar Pradhan  Assistant Professor

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities:

1. Brain-behaviour Relations
2. Economics of Growth
3. Financial Economics
4. Financial Institutions and Markets
5. Gender and Trade
6. Human Resource Development
7. Interpersonal, Intercultural and Organizational Communication
8. Non-verbal Communication
9. Quantitative Economics
10. Sociology of Health and Medicine
11. Visual Aesthetics

Thrust Areas:

1. Development Studies
2. Human Resource Management and Ethics
3. Cultural Studies and Communication

ON-GOING RESEARCH PROJECTS
### Sponsored Projects:

<table>
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<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
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<tbody>
<tr>
<td>1.</td>
<td>Animated Texts: Communicating in a Multimedia Environment</td>
<td>Indian Council of Social Science Research</td>
<td>Rs. 3.80 L</td>
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<tr>
<td>2.</td>
<td>Bollywood’s Transnational Flows</td>
<td>Indo-Canadian Shastri Institute</td>
<td>Rs. 6.00 L</td>
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<tr>
<td>3.</td>
<td>Concept Paper on Disaster Management</td>
<td>Defence Institute of Psychological Research, New Delhi</td>
<td>Rs. 4.86 L</td>
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<tr>
<td>4.</td>
<td>Demeanor Analysis</td>
<td>Defence Institute of Psychological Research, New Delhi</td>
<td>Rs. 9.80 L</td>
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<td>5.</td>
<td>Development of Training Package on Interview and Interrogation Techniques</td>
<td>Defence Institute of Psychological Research, New Delhi</td>
<td>Rs. 4.85 L</td>
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<td>6.</td>
<td>Gender and Trade in Silk Industry: A Study in Silk Workers in Sualkuchi in Assam</td>
<td>United Nations Development Programme</td>
<td>Rs. 2.64 L</td>
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<td>7.</td>
<td>Impact of Globalization and Adoption of New Technology on Silk Industry in Assam: An Assessment from Gender Perspective</td>
<td>DSIR, New Delhi</td>
<td>Rs. 6.83 L</td>
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### Consultancy Projects:

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<th>Amount</th>
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<tbody>
<tr>
<td>1.</td>
<td>Comprehensive Socio-Economic Survey for Pakri-Barwadih Coal Mining project</td>
<td>NTPC, Noida</td>
<td>Rs. 17.00 L</td>
</tr>
</tbody>
</table>

### VISITS ABROAD BY FACULTY MEMBER

1. Prof. Anjali Gera Roy Visited Canada: Indo-Canadian Shastri Fellowship, 2007

### INVITED LECTURES BY FACULTY MEMBERS

1. Prof. Suhita Chopra Chatterjee Health and National Youth Policy (IIM Calcutta)
2. Prof. Anjali Gera Roy Is There an Indian Culture? (Bangalore)
3. Prof. Anjali Gera Roy How to Publish in International Journals (Kolkata)
4. Dr. Priyadarshi Patnaik  
   Changing Times: Learning in Multimedia Environment (Padmanava College of Engineering, Rourkela)

5. Prof. Kailash Bihari Lal Srivastava  
   Knowledge Management (ITER, Bhubaneswar)

**LECTURE BY VISITING EXPERT**

1. Prof. Eckhard Breitinger, Dr. Pia Thielman, University of Bayreuth, Germany  
   Cultural practices and conflict mediation

2. Prof. Leslie P. Francis, Prof. John Francis University of Utah, USA  
   Ethics and law

**THESES (Doctoral and MS)**

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sudeep Budhaditya Deb</td>
<td>Joint Forest Management: A Case Study of Bankura (North Division)</td>
</tr>
<tr>
<td>2.</td>
<td>Vani Archana</td>
<td>Foreign Direct Investment in India: Industry and State Level Analysis</td>
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</table>

**BOOK PUBLISHED**

<table>
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<tr>
<th>#</th>
<th>Name of the Author(s)</th>
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<th>Publisher</th>
<th>Year</th>
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<tbody>
<tr>
<td>1.</td>
<td>Prof. S. C. Chatterjee, Dr. P. Pattnaik and Mr. V. Chariar (Eds.)</td>
<td>Discourses on aging and dying</td>
<td>Sage, New Delhi</td>
<td>2008</td>
</tr>
<tr>
<td>2.</td>
<td>Dr. H. S. Komalesha</td>
<td>Issues of identity in Indian English fiction: A close reading of canonical Indian English novels</td>
<td>Peter Lang, UK</td>
<td>2008</td>
</tr>
<tr>
<td>3.</td>
<td>Dr. H. S. Komalesha</td>
<td>Anupama niranjana</td>
<td>Sahitya Akademi, New Delhi</td>
<td>2008</td>
</tr>
<tr>
<td>5.</td>
<td>Prof. A. G. Roy and Mr. M. T. Pillai</td>
<td>Rohinton Mistry: An anthology of recent criticism</td>
<td>Pencraft, Delhi</td>
<td>2007</td>
</tr>
</tbody>
</table>
7. Prof. M. B. Sharan and Prof. D. Suar (Eds.) Management through interpersonal relationships Jaico Publishing, Mumbai 2008
8. Dr. S. M. Singh The fiction of Alice Walker: A study of black images Authors Press, New Delhi 2008

LAURELS & DISTINCTIONS


SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

1. Short-term course on Small industries Management March 27 – June 30, 2007
DEPARTMENT OF INDUSTRIAL ENGINEERING & MANAGEMENT

HEAD : Professor Pradip Kumar Ray

FACULTY

Professor :

Acharya, D. Ph.D., Operations Research, Quality Engineering, Production Planning
Banerjee, R. N. PGDM, Computer Applications, Management Information Systems
Mohapatra, P. K. J. Ph.D., System Dynamics, Quality Engineering, Software Engineering, E-business
Ray, P. K. Ph.D., Ergonomics / Human Factors Engineering, Productivity Engineering, Quality Design and Control, Materials Management
Sahu, S. Ph.D., Operations Management, Logistics and Supply Chain Management
Srinivasan, S. Ph.D., Engineering Economics, Financial Management

Associate Professor :

Maiti, J. Ph.D., Safety and Health Management, Probabilistic Risk Assessment, Ergonomics, Statistical Quality Control
Naikan, V. N. A. Ph.D., Condition Monitoring, Mechanical System Reliability, Quality Planning and Management
Tiwari, M. K. Ph.D., Intelligent DSS, Design of Manufacturing Systems, Evolutionary Computing, Supply Chain Management

Assistant Professor :

Jenamani, M. Ph.D., e-Business, Website Design, Web user Behavior Analysis, Electronic Auction and Negotiation
Sarmah, S. P. Ph.D., Operations Research, Production Planning and Control, Supply Chain Management, Inventory Management

Lecturer (Senior Scale) :

Nandy, A. Fellow of IIM Calcutta, Networks Modeling, Simulation, Small World Networks

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION
Faculty Appointment:

Dr. M. K. Tiwari  
Associate Professor

A. Nandy  
Lecturer (Senior Scale)

Faculty Promotion:

Dr. J. Maiti  
Associate Professor

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities:

The focus of the department is to provide world-class education to the students and the researchers in the field of industrial engineering and its allied disciplines, and to work closely with the industrial community for improving their work systems and business processes by using the cutting-edge technology and management practices. The department provides an excellent environment which is the right blend of academic and industry interactions to groom its faculties as well as the students. With world-class research, wide industrial exposure, and close faculty-student interaction, the department ensures that a strong foundation is set for the students before they start their journey as industrial experts and consultants.

Further, the department is actively involved in sponsored research and industrial consultancy. Major funding agencies for sponsored research are DST, MHRD, CSIR, ICAR, UGC, and industries. Since its inception, the department has been providing consulting services to the industries and government organizations in the field of industrial engineering and management. The value of this consulting work is around Rs 40 crore during the last five years. The major sponsors of these consulting assignments are: Tata Steel, Coal India, Neyveli Lignite, NALCO, SAIL, IMFA, OMC, ACC, and IAF

Thrust Areas:

The Department is keen on working in the areas pertaining to contemporary industrial problems. Some of these areas are as follows:

1. Product and Production System Design
2. Productivity Engineering
3. Work System Design
4. Product Development
5. Technology Management
6. Quality Control and Engineering
7. Networks and Project Management
8. Inventory Control
9. Logistics and Supply Chain Management
10. Optimization Tools and Techniques
11. Ergonomics and Human Factors Engineering
12. Risk Assessment and Safety Engineering and Management
13. ERP and e-Business
14. Software Engineering and Software Project Management
15. Knowledge Management
16. Evolutionary Computing

ON-GOING RESEARCH PROJECTS

**Sponsored Projects:**

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ergonomics and Human Factor Engineering and e-Business Laboratory Development</td>
<td>DST, New Delhi</td>
<td>Rs. 60.00 Lakhs</td>
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<tr>
<td>2.</td>
<td>Development and Test of a Socio-Technical Model for Assessing Occupational Risk of Injuries and Illness to Mine Workers</td>
<td>CSIR, New Delhi</td>
<td>Rs. 8.64 Lakhs</td>
</tr>
<tr>
<td>3.</td>
<td>Development of decision support model for supply chain coordination</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
</tr>
<tr>
<td>4.</td>
<td>Technology adoption in tea industry with special reference to NE, India</td>
<td>DSIR, New Delhi</td>
<td>Rs. 6.50 Lakhs</td>
</tr>
<tr>
<td>5.</td>
<td>Agent-mediated Electronic Auctions and Negotiations</td>
<td>MHRD, New Delhi</td>
<td>Rs. 18.00 Lakhs</td>
</tr>
<tr>
<td>6.</td>
<td>Productivity of Agricultural Systems – A Data Envelopment Analysis Approach</td>
<td>ICAR, New Delhi</td>
<td>Rs. 10.76 Lakhs</td>
</tr>
<tr>
<td>7.</td>
<td>Hazard evaluation, risk assessment and accident causation in mines – An application of multivariate statistical models and neural networks</td>
<td>DST, New Delhi</td>
<td>Rs. 6.40 Lakhs</td>
</tr>
<tr>
<td>8.</td>
<td>Automated negotiation and trust management in electronic market places</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
</tr>
<tr>
<td>9.</td>
<td>Exploring trust, fraud and privacy issues in E-business</td>
<td>DST, New Delhi</td>
<td>Rs. 8.00 Lakhs</td>
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</table>

**Consultancy Projects:**

<table>
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<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
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<tbody>
<tr>
<td>1.</td>
<td>Manpower Study at Mines Division of IMFA Ltd., Bhubaneswar</td>
<td>IMFA Ltd., Bhubaneswar</td>
<td>Rs. 8.00 Lakhs</td>
</tr>
<tr>
<td>2.</td>
<td>Strategic Options Study for Rural Roads under R D Department</td>
<td>Govt. of Orissa</td>
<td>-</td>
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<td>3.</td>
<td>Techno Economic Feasibility Study of Hindustan Cables Ltd., Calcutta</td>
<td>HCL, Kolkata</td>
<td>Rs. 36.00 Lakhs</td>
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<td>4.</td>
<td>Study on Ancillary Industry of PSCO India</td>
<td>POSRI, Rep. of Korea</td>
<td>Rs. 26.00 Lakhs</td>
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<tr>
<td>5.</td>
<td>Development of Educational Complex</td>
<td>Tirupati Asset</td>
<td>Rs. 50.00 Lakhs</td>
</tr>
<tr>
<td>6.</td>
<td>Study on Ore Loss during Material Handling for OMC Operated Mines</td>
<td>OMC, Bhubneswar</td>
<td>Rs. 7.50 Lakhs</td>
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</tbody>
</table>
7. Developing a Maturity Model to Transform ‘Potential’ Organizational Resources to Assets (based on AXELL) Rs. 9.00 Lakhs

VISITS ABROAD BY FACULTY MEMBER

1. Dr. M. Jenamani
   International Conference on Industrial Informatics, INDIN 2007, July 23-27, 2007 (Vienna, Austria)
2. Dr. S. P. Sarmah
   Present paper and Session Chair at International Conference of IEEEM, December 2–5, 2007 (Singapore)
3. Prof. B. Mahanty
   August 4-10, 2007 (Seoul, Pohang and Gwangyang in South Korea)
4. Prof. P. K. J. Mohapatra
   August 4-10, 2007 (Seoul, Pohang and Gwangyang in South Korea)

INVITED LECTURES BY FACULTY MEMBERS

1. Dr. M. K. Tiwari
   A European Council Project - Next-Gen Project initiated by Prof C Lalwani of University of Leeds, UK, February 02, 2008 (Indian Institute of Technology Mumbai)
2. Dr. Mamata Jenamani
   e-procurement organized during International Conference of Issues and Challenges in Supply Chain Management (ICSCM –2008), March 28-30, 2008 (Institute of Technology, Benaras Hindu University, Varanasi)

LECTURE BY VISITING EXPERT

1. Prof. M. K. Kolay, University of South Pacific, Suva, Fiji Islands
   Real Options in Financial Engineering
2. Prof. Steve Bradley, Lancaster University of Management School, UK
   Diversity, choice and the quasi-market: an empirical analysis of England’s secondary education policy
3. Dr. Santanu Dey, Center for Operations Research and Econometric, Universite Catholique de Louvain, Belgium
   Cutting Planes for Unstructured Mixed Integer Programs Using Multiple Constraints
4. Prof. Gautam Datta
   Indian Institute of Management Ahmedabad
   Revenue Management

THESES (Doctoral and MS)
<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
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<tbody>
<tr>
<td>1</td>
<td>Ranjit Kumar Das</td>
<td>Design and Development of a Framework for Warranty Data Analysis</td>
</tr>
<tr>
<td>2</td>
<td>Rajib Kumar Mohapatra</td>
<td>Optimization and Decision Support Models for Supply Chain Management of a Ferro Alloys Company</td>
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<tr>
<td>3</td>
<td>Indrajit Mukherjee</td>
<td>Modelling and Optimization of Abrasive Metal Cutting Processes</td>
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<tr>
<td>4</td>
<td>S. V. Patil</td>
<td>e-Governance Focused Conceptual Transformation Model and Framework for Technical Universities in India</td>
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<tr>
<td>5</td>
<td>Ashutosh Sarkar</td>
<td>Models for Supplier Base Rationalization and Third-Party Logistics</td>
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<tr>
<td>6</td>
<td>Subhash Chandra Panja</td>
<td>A Study on Signalling Systems of Indian Railways</td>
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**BOOK PUBLISHED**

<table>
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<tr>
<th>#</th>
<th>Name of the Author(s)</th>
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<th>Publisher</th>
<th>Year</th>
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<tbody>
<tr>
<td>1</td>
<td>Dr. M. K. Tiwari</td>
<td>Swarm Intelligence, Focus on Ant and Particle Swarm Optimization</td>
<td>I-Tech Education and Publishing, Vienna, Austria</td>
<td>2007</td>
</tr>
</tbody>
</table>

**LAURELS & DISTINCTIONS**

1. Dr. M. K. Tiwari  
   Associate Editor of the Journal of Intelligent Manufacturing

2. Dr. M. K. Tiwari  
   Editorial Board Member of the International Journal of Mechanical Engineering Science, Proceedings the IMechE, (Part C)

3. Dr. M. K. Tiwari  
   Editorial Board Member of the International Journal of Computer Integrated Manufacturing (IJCIM)

4. Dr. M. K. Tiwari  
   Editorial Board Member of the International Journal of Business and Systems Research (IJBSR)

5. Dr. M. K. Tiwari  
   Editorial Board Member of the International Journal of Mathematics of Operational Research (IJMOR)

6. Dr. M. K. Tiwari  
   Editorial Board Member of the International Journal of Manufacturing Research (IJMR)

**SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED**
1. Training Programme on Materials Management for Probationary Officers of IR Stores Service (SF)  
   June 11 – July 06, 2007
2. Training Programme on Project Management Fundamentals for McNally Bharat Co. Ltd.  
   August 27–31, 2007
3. QIP Short Term Course on Supply Chain Management  
   October 03–10, 2007
4. 3-day Training Programme on Facility Layout Design for Tata Steel, Jamshedpur  
   February, 2008
DEPARTMENT OF MATHEMATICS

HEAD : Professor Akhil Ranjan Roy

FACULTY

Professor :

Bhattacharyya, S. M.Sc., Ph.D. (IISc Bangalore), Computational Fluid Dynamics, Numerical Analysis
Biswal, M. P. M.Sc., Ph.D. (IIT Kharagpur), Operations Research and MCDM, Computational Statistics, Game Theory
Goswami, A. M.Sc., Ph.D. (Jadavpur University), Computer Science, Operations Research
Gupta, D. K. M.Sc., DIIT, Ph.D. (IIT Kharagpur), Computer Science and Numerical Analysis
Gupta, U. C. M.A., Ph.D. (IIT Delhi), Statistics, Queuing Theory
Jain, V. K. M.Sc., Ph.D. (IIT Delhi), Complex Analysis
Kumar, S. M.Sc., Ph.D. (IIT Kanpur), Statistical Decision Theory and Inference, Quantum Computing
Misra, J. C. M.Sc., Ph.D., D.Sc. (Calcutta University), Bio Mathematics
Nanda, S. M.Sc., Ph.D. (Sambalpur University), Functional Analysis, Fuzzy Mathematics, Optimization
Srivastava, P. D. M.Sc., Ph.D. (IIT Kanpur), Functional Analysis, Complex Analysis

Associate Professor :

Kumar, P. B.Tech., Ph.D. (IIT Kanpur), Computer Science
Murthy, P. V. S. N. M.Sc., Ph.D. (IIT Kanpur), Convective Transport in Porous Media, Fluid Mechanics
Raja Sekhar, G. P. M.Sc., M.Phil., Ph.D. (Hyderabad), Mathematical Fluid Mechanics, Boundary Integral Methods for porous media

Assistant Professor :

Gayen, R. M.Sc., Ph.D. (Calcutta University), Fluid Dynamics, Integral
Equations

Ghosal, K. M.Sc., Ph.D. (Jadavpur University), Sediment Transport in Turbulent Flow


Nahak, C. M.Sc., Ph.D. (IIT Kharagpur), Applied Functional Analysis and Optimization, Fractional Calculus

Nanda, A. K. M.Sc., Ph.D., (Chandigarh), Entropy, Reliability, Statistics

Panda, G. M.Sc., Ph.D. (Utkal University), Optimization Technique

Panigrahi, P. M.Sc., Ph.D. (ISI Bangalore), Graph Theory, Combinatorics

Visiting Faculty:

Biswa, D. M.Sc., Ph.D., (Leeds, UK), Clifford Analysis, Functional Analysis

Emeritus Professor: INSA Senior Scientist

Gupta, A. S. D.Sc.

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Faculty Appointment:

Dr. D. Biswas Assistant Professor

Faculty on Re-employment (Upto 65 years age):

Prof. J. C. Misra Professor

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities:

Faculty members of the Department are currently engaged in their individual sponsored projects listed below (On-going Research Projects)

Thrust Areas:

1. Fluid Mechanics
2. Functional Analysis

New Acquisitions:
A new FIST sponsored computer laboratory has been set up during the year under review.

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects :**

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Classification of hyperspectral remote sensing data to discriminate between crop condition, variety and stage</td>
<td>ISRO</td>
<td>Rs. 7.50 Lakhs</td>
</tr>
<tr>
<td>2</td>
<td>Wall Proximity on Bluff Body weight : Three Dimensional aspect</td>
<td>CSIR, New Delhi</td>
<td>Rs. 12.00 Lakhs</td>
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<td>3</td>
<td>Boundary Integral Work Bench for Viscous flow through Porous Media</td>
<td>DST, New Delhi</td>
<td>Rs. 9.33 Lakhs</td>
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<td>4</td>
<td>Integration of Fuzziness and Randomness with Special Emphasis to Re-modeling of Inventory Problems</td>
<td>DST, New Delhi</td>
<td>Rs. 5.50 Lakhs</td>
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<tr>
<td>5</td>
<td>Studies on the equilibrium problems under generalized convexity and generalized monotonicity in banach space</td>
<td>CSIR, New Delhi</td>
<td>Rs. 7.26 Lakhs</td>
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<td>6</td>
<td>Turbulence suspension over sandy bedforms : Experimental and theoretical studies</td>
<td>DST, New Delhi</td>
<td>Rs. 1.26 Lakhs</td>
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<td>7</td>
<td>Singularity methods for Stokes flows in presence of rigid / porous planar interface</td>
<td>CSIR, New Delhi</td>
<td>Rs. 7.56 Lakhs</td>
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<td>8</td>
<td>Nonlinear Singular Boundary Value Problems Arising in Physiology</td>
<td>CSIR, New Delhi</td>
<td>Rs. 5.66 Lakhs</td>
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<td>9</td>
<td>On Stochastic Order Relations with Applications in Reliability</td>
<td>DST, New Delhi</td>
<td>Rs. 7.45 Lakhs</td>
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<td>10</td>
<td>Integration of Fuzziness and Randomness with Special Emphasis to Re-modeling of Inventory Problems</td>
<td>DST, New Delhi</td>
<td>Rs. 3.51 Lakhs</td>
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<td>11</td>
<td>A Genetic Algorithmic Approach to Solve Generalized Non-Linear Optimization Models with Hybrid Data</td>
<td>MHRD, New Delhi</td>
<td>Rs. 5.00 Lakhs</td>
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<td>12</td>
<td>Linguistic Information Processing for Decision Making in An Evaluation Programme</td>
<td>IIT Kharagpur</td>
<td>Rs. 1.00 Lakhs</td>
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<td>14</td>
<td>Classification of Hyperspectral remote sensing data to discriminate between crop condition variety and stage</td>
<td>ISRO</td>
<td>Rs. 7.48 Lakhs</td>
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<td>15</td>
<td>FIST Program</td>
<td>DST, New Delhi</td>
<td>Rs. 21.00 Lakhs</td>
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<td>16</td>
<td>Wall proximity on bluff body wake : 3-D aspects</td>
<td>CSIR, New Delhi</td>
<td>Rs. 21.00 Lakhs</td>
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<td>17</td>
<td>FIST program</td>
<td>DST, New Delhi</td>
<td>Rs. 22.00 Lakhs</td>
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<td>18</td>
<td>Flow perturbation and sediment suspension over sandy bedforms: Theoretical and</td>
<td>DST, New Delhi</td>
<td>Rs. 6.00 Lakhs</td>
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</table>
19. Effects of Non-linearity and viscoelasticity of blood and wall tissue and magnetohydrodynamic states

VISITS ABROAD BY FACULTY MEMBER

1. Prof. S. Bhattacharyya Max Planck Institute, Bremen, Germany (1 year from June 2006 to July 2007)
2. Dr. G. P. Raja Sekhar To initiate collaboration, MoU (Centre for Industrial Mathematics, University of Bremen)
3. Dr. G. P. Raja Sekhar To present a paper in the GAMM 2008 (University of Bremen, Germany)
4. Prof. S. S. Alam To participate in an International Conference (Dallas, Texas, USA) (May 4-7, 2007)
5. Dr. Soumen Maity To present a paper in Indo-French Workshop on Cryptography and Related topics (IFW) (Paris) (July 11–13, 2007)
6. Prof. U. C. Gupta To carry out collaborative research work (Department of Mathematics and Computer Science, Royal Military College of Canada) (June 22 – July 16, 2007)

INVITED LECTURES BY FACULTY MEMBERS

1. Dr. A. K. Nanda Recent Advances in Operations Research and Related Computational Aspects (Department of Applied Mathematics, University of Calcutta)
2. Prof. Somnath Bhattacharyya CFD for Industrial Mathematics (Pune University College)
3. Dr. C. Nahak Mathematical Programming and its Applications (DRIEMS, Cuttack)

LECTURE BY VISITING EXPERT

1. Prof. Gautam Goswami On Quantitative Finance
   Associate Director
   School of Business
   Fordham University (USA)
2. Prof. R.N. Mohapatra Diffusion Wavelets & Optimal Filter for Automatics Target
   University of Central Florida, (USA)
3. Dr. Anirban Banerjee Analyzing Structure and evaluation of a graph by its Laplacian Spectra
   Bio Mathematics Division
   Max Planck Institute of Mathematics
   Germany
4. Prof. M. L. Chaudhri Numerical Inversion of Generating Functions
A complete solution to the queue length distribution of a bulk arrival / bulk service queue

THESES (Doctoral and MS)

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>P. Anantha Lakshmi Narayana</td>
<td>Free Convective Transport in Porous Media with Emphasis on Second Order Effects</td>
</tr>
<tr>
<td>2.</td>
<td>Pankaj Dutta</td>
<td>Redefining Some Inventory Management Problems in Imprecise and / or Uncertain Environment</td>
</tr>
<tr>
<td>4.</td>
<td>Narmada Behera</td>
<td>Optimality Conditions and Duality Results under Generalized p-(η,θ)-B- Invexity Banach Space</td>
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<tr>
<td>5.</td>
<td>S. Dhinakaran</td>
<td>Unsteady Flow and Heat / Mass Transfer form Solid / Porous Bodies – A numerical Treatment</td>
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</tbody>
</table>

LAURELS & DISTINCTIONS

1. Prof. S. Bhattacharyya Max Planck, Germany Fellowship, 2007

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

1. Some Recent Research Directions in Graph Theory May 26–30, 2008
**DEPARTMENT OF MECHANICAL ENGINEERING**

**HEAD:** Professor Ajay Kumar Chattopadhyay

**FACULTY**

**Professor:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Qualification</th>
<th>Specializations</th>
</tr>
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<tbody>
<tr>
<td>Bhattacharyya, Ranjan</td>
<td>Ph.D. (Kentucky), Applied Mechanics</td>
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<tr>
<td>Bhattacharyya, Sati</td>
<td>Ph.D. (IIT Kharagpur), Fluid Mechanics</td>
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<tr>
<td>Nath</td>
<td>Ph.D. (Texas A&amp;M), Thermal Science &amp; Engineering</td>
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<tr>
<td>Brahma, Ranajit Kumar</td>
<td>Ph.D. (IIT Kharagpur), Thermal Science &amp; Engineering</td>
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<tr>
<td>Chattopadhyay, Ajay</td>
<td>Ph.D. (Jadavpur University), Production Engineering</td>
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<tr>
<td>Kumar</td>
<td>Ph.D. (IIT Kharagpur), Heat Transfer, Fluid Flow</td>
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<tr>
<td>Das, Prasanta Kumar</td>
<td>Ph.D. (IIT Kharagpur), Thermodynamics, Fluid Mechanics, CFD, Heat Transfer</td>
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<td>Dash, Sukanta Kumar</td>
<td>Ph.D. (IIT Kharagpur), Machine Design, Material Handling Equipment Design</td>
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<td>Karmakar, Ranjit</td>
<td>Ph.D. (IIT Kharagpur), Applied Mechanics</td>
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<td>Maiti, Rathindranath</td>
<td>Ph.D. (IIT Kharagpur), Machine Design, Material Handling Equipment Design</td>
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<td>Mohanty, Amiya Ranjan</td>
<td>Ph.D. (Kentucky), Applied Mechanics</td>
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<td>Mukherjee, Amalendu</td>
<td>Ph.D. (IIT Kharagpur), System Dynamics and Control</td>
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<td>Pradhan, Brajabandhu</td>
<td>Ph.D. (IIT Kharagpur), Machine Design, FEM</td>
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<tr>
<td>Roy Chowdhury, Samar</td>
<td>Ph.D. (Birmingham), Industrial Tribology, Nano-Tribology, Bio-Tribology, Flash Temperature between Rubbing Bodies, Feed Back Control System of Bearings</td>
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<tr>
<td>Kumar</td>
<td>Ph.D. (IIT Kanpur), Thermal Sciences, Solar Energy Thermal Systems Simulation, Meteorological Synthetic Data Generation</td>
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<td>Som, Sankar Kumar</td>
<td>Ph.D. (IIT Kharagpur), Thermal Science and Engineering</td>
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<td>Maiti, Biswajit</td>
<td>Ph.D. (IIT Delhi), Fluid Machinery, Two-phase Flow, FEM</td>
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<td>Paul, Soumitra</td>
<td>Ph.D. (IIT Kharagpur), Manufacturing</td>
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**Associate Professor:**

<table>
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<tr>
<td>Biswas, Kajal</td>
<td>Ph.D. (IIT Kharagpur), Manufacturing Science and Engineering</td>
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<tr>
<td>Dasgupta, Anirvan</td>
<td>Ph.D. (Kanpur), Mechanics, Dynamics and Control</td>
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<tr>
<td>Kumar, Cheruvu Siva</td>
<td>Ph.D. (IIT Kharagpur), Robotics, Control Systems, Computer Networks</td>
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<tr>
<td>Moulic, Sandipan Ghosh</td>
<td>Ph.D. (Arizona), Thermal Engineering</td>
<td></td>
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<tr>
<td>Prathihar, Dilip Kumar</td>
<td>Ph.D. (IIT Kanpur), Soft Computing, Robotics, Manufacturing</td>
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<tr>
<td>Ramgopal, Maddali</td>
<td>Ph.D. (IIT Madras), Refrigeration and air conditioning</td>
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<tr>
<td>Roy, Subhransu</td>
<td>Ph.D. (Penn. State), Heat Transfer</td>
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<tr>
<td>Ray, Kumar</td>
<td>Ph.D. (IIT Kharagpur), Machine Dynamics</td>
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</tbody>
</table>
Ray, Manas Chandra  Ph.D.(IIT Kharagpur), Applied Mechanics, Smart Structures, Carbon nanotube reinforced composite, Piezoelectric fiber reinforced composite
Roy Chowdhury, Asimava  Ph.D.(IIT Kharagpur), Manufacturing Science and Engineering, CNC, Rapid Prototyping, Laser processing, CNC : 2D Machining, 3D freeform machining, RPT : Direct slicing, LOM, Laser: Sintering, Alloying, Coating, Developmentof nano-structured MMC
Das, Manab Kumar  Ph.D. (IIT Kanpur). Fluid Mechanics and Heat Transfer

Assistant Professor :
Bandyopadhyay, Partha Pratim  Ph.D.(IIT Kharagpur), Manufacturing Science and Engineering
Bhattacharyya, Kingshook  Ph.D. (IIT Kharagpur), Dynamics
Chakraborty, Goutam  Ph.D. (IIT Kanpur), Applied Mechanics
Gupta, Sanjay  Ph.D.(Delft), Biomechanics, Stress Analysis
Pal, Surjya Kanta  Ph.D. (IIT Kharagpur), Manufacturing Process Modeling, Soft Computing in Machining
Ramanujam, S.  Ph.D.(IIT Kharagpur), IC Engines
Samantaray, Arun Kumar  Ph.D. (IIT Kharagpur), Modeling and Simulation, Systems and Control, Fault Detection and Isolation, Fault Tolerant Control
Saha, Partha  Ph.D.(IIT Kharagpur), Laser Processing
Sarangi Mihir  Ph.D. (IIT Kharagpur), Machine Design Tribology

Emeritus Professor :
Datta, Gouranga Lal  Ph.D.(IIT Kharagpur), Production Engineering, Welding and Foundry Technology, NDT Evaluation, Quality Assurance and Reliability

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Faculty Appointment :
Dr. Manab Kumar Das  Associate Professor

RESEARCH AND DEVELOPMENT

Thrust Areas :
1. Analytical & Computational Fluid Dynamics
2. Bio-Mechanics
3. Combustion
4. Composite Materials and Smart Structures
5. Carbon Nanotube Reinforced Composites
6. Condition Monitoring and Diagnostics
7. Echo-Friendly Refrigeration
8. Fluid Drives and Control
9. High Speed Machining, Grinding and Development of Cutting Tools / Grinding Wheel
10. Laser Processing of Materials
11. Micro Manufacturing and Microscale Transport Processes
13. Multiphase Flows and Heat Transfer
15. Rapid Prototyping
16. Tribological Design of Machineries
17. Automation and control
18. Online fault detection and isolation
19. Fault tolerant control
20. Soft computing and Expert systems
21. Nonlinear Elasticity
22. Rotor Dynamics
23. Coating of cutting tools and environment-friendly high efficiency machining
24. Bio-micro-fluidics and microscale transport processes
25. CFD/Lattice Boltzmann Method in Complex Flows

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects :**

<table>
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<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Preclinical analysis and development of improved acetabular prostheses</td>
<td>British Council</td>
<td>Rs. 57.18 Lakhs</td>
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<tr>
<td>2</td>
<td>Biomechanical Analysis and Design of Orthopaedic Implant</td>
<td>DBT, New Delhi</td>
<td>Rs. 51.12 Lakhs</td>
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<tr>
<td>3</td>
<td>High Power Laser Workstation with Fibre Laser(2kw) and CNC Work Station</td>
<td>MHRD, New Delhi</td>
<td>Rs. 201.00 Lakhs</td>
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<tr>
<td>4</td>
<td>Visualization and optical diagnosis of two-phase flow; bubbles and droplet distribution and dynamics pertaining to carry-over and carry-under phenomenon</td>
<td>BARC/DAE, Mumbai</td>
<td>Rs. 35.80 Lakhs</td>
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<td>5</td>
<td>2D Laser Doppler Velocimetry and Phase Doppler Particle Analyser</td>
<td>MHRD-FIST, New Delhi</td>
<td>Rs. 120.00 Lakhs</td>
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<td>6</td>
<td>Establishment of an Advanced Research Facility for EB Welding and Process Development Related to Programs of Interest to DAE</td>
<td>DAE/BRNS, Mumbai</td>
<td>Rs. 128.60 Lakhs</td>
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<td>7</td>
<td>Electro-hydrodynamic enhancement of heat transfer in free convection</td>
<td>CSIR, New Delhi</td>
<td>Rs. 5.00 Lakhs</td>
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<td>8</td>
<td>Surface Integrity in High Efficiency Grinding by Super–abrasive Wheels</td>
<td>MHRD, New Delhi</td>
<td>Rs. 25.00 Lakhs</td>
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<td>9.</td>
<td>EHD enhancement of natural convection of heat transfer</td>
<td>CSIR, New Delhi</td>
<td>Rs. 10.00 Lakhs</td>
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<td>10.</td>
<td>CO2 based industrial heat pumps prototype design and development</td>
<td>MHRD, New Delhi</td>
<td>Rs. 9.00 Lakhs</td>
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<tr>
<td>11.</td>
<td>Development and characterization of novel nanocrystalline metallic/ceramic based hydrogen sensor materials</td>
<td>MHRD, New Delhi</td>
<td>Rs. 15.00 Lakhs</td>
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<td>12.</td>
<td>Visualization and Optical Diagnosis of Two-Phase Flow Bubbles and Droplet Distribution and Dynamics Pertaining to Carry-Over</td>
<td>BARC, Mumbai</td>
<td>Rs. 39.00 Lakhs</td>
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<td>13.</td>
<td>Transient Boiling and Counter Current Flow Phenomena during Direct in Bundle Emergency Coolant Injection</td>
<td>BARC, Mumbai</td>
<td>Rs. 42.00 Lakhs</td>
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<td>14.</td>
<td>Compressor driven metal hydride cooling and heating systems</td>
<td>MNES, New Delhi</td>
<td>Rs. 19.50 Lakhs</td>
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<td>15.</td>
<td>Studies on Application of Phase Change Materials In Domestic Frost –free refrigerators</td>
<td>IIT Kharagpur</td>
<td>Rs. 0.50 Lakhs</td>
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<tr>
<td>16.</td>
<td>Carbon dioxide based heat pump systems for simultaneous cooling and heating applications</td>
<td>MHRD, New Delhi</td>
<td>Rs. 7.00 Lakhs</td>
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<td>17.</td>
<td>Removal of Obsolescence and Modernization of Refrigeration and Air Conditioning Laboratory</td>
<td>MHRD, New Delhi</td>
<td>Rs. 20.00 Lakhs</td>
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<td>18.</td>
<td>Sputter coating of Mos2 based composite on cutting tool</td>
<td>MHRD, New Delhi</td>
<td>Rs. 12.00 Lakhs</td>
</tr>
<tr>
<td>19.</td>
<td>Advanced research in mechanical engineering systems</td>
<td>DST FIST, New Delhi</td>
<td>Rs. 700.00 Lakhs</td>
</tr>
<tr>
<td>20.</td>
<td>Surface integrity in high efficiency grinding</td>
<td>MHRD, New Delhi</td>
<td>Rs. 25.00 Lakhs</td>
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<tr>
<td>21.</td>
<td>Design, Development and Performance Study of a New Concept Harmonic Drive</td>
<td>DST, New Delhi</td>
<td>Rs. 10.00 Lakhs</td>
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<tr>
<td>22.</td>
<td>FIST Programme-Advanced Research in Mechanical Engineering Systems</td>
<td>DST, New Delhi</td>
<td>Rs. 694.00 Lakhs</td>
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<td>23.</td>
<td>Beam delivery system with illumination and imaging optics for micromachining with already operational Excimer laser</td>
<td>DST-FIST, New Delhi</td>
<td>Rs. 70.00 Lakhs</td>
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<td>24.</td>
<td>High Power Laser orkstation</td>
<td>DST-FIST, New Delhi</td>
<td>Rs. 201.00 Lakhs</td>
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<tr>
<td>25.</td>
<td>Design, Development and Performance Study of a New Concept Harmonic Derive</td>
<td>DST, New Delhi</td>
<td>Rs. 10.00 Lakhs</td>
</tr>
<tr>
<td>26.</td>
<td>National Grid Computing Project</td>
<td>GARUDA (IIT Kharagpur, CDAC and ERNET India)</td>
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<tr>
<td>27.</td>
<td>Establishment of Nationwide QoS Testbed network</td>
<td>Ministry of Information Technology, New Delhi</td>
<td>Rs. 126.00 Lakhs</td>
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<tr>
<td>No.</td>
<td>Project Title</td>
<td>Funding Body</td>
<td>Location</td>
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<td>28.</td>
<td>Development of Autonomous Underwater Vehicle</td>
<td>DOD, New Delhi</td>
<td>Rs. 697.00 Lakhs</td>
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<td>29.</td>
<td>Composite Applications Laboratory</td>
<td>TIFAC, DST, New Delhi</td>
<td>Rs. 346.00 Lakhs</td>
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<tr>
<td>30.</td>
<td>Active Structural-Acoustic Control of Smart Structures using 1-3 Piezoelectric Composite Materials</td>
<td>DST, New Delhi</td>
<td>Rs. 16.40 Lakhs</td>
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</tbody>
</table>
48. Drill wear monitoring using softcomputing techniques
   IIT Kharagpur Rs. 3.00 Lakhs
49. Indo-South African Project on “Machine Tool Vibration Monitoring”
   DST (India), NRF (South Africa) Rs. 3.50 Lakhs
50. Multi-sensor Based Tool Condition Monitoring in Drilling
   CSIR, New Delhi Rs. 7.56 Lakhs
51. Online component fault detection and isolation using diagnostic bond graphs
   IIT Kharagpur Rs. 3.00 Lakhs
52. Intelligent data mining for forward and reverse modeling of manufacturing processes
   DST, New Delhi Rs. 15.18 Lakhs
53. Design and Development of adapting robot controller using soft computing
   DST, New Delhi Rs. 8.38 Lakhs
54. Flow and Heat Transfer Modeling in Thrust Chamber of a Rocket Engine
   ISRO Rs. 8.00 Lakhs

Consultancy Projects :

<table>
<thead>
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<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
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<tbody>
<tr>
<td>1</td>
<td>Shaft bearing system analysis</td>
<td>GE JFWTC</td>
<td>Rs. 1.38 Lakhs</td>
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<tr>
<td>2</td>
<td>Development of Liquid-Spring Shock Isolation Technology</td>
<td>R&amp;DE (Engineers), DRDO Pune</td>
<td>Rs. 10.00 Lakhs</td>
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<tr>
<td>3</td>
<td>Setting up a research and development centre for Damodar Valley Corporation at Kolkata</td>
<td>Damodar Valley Corporation, Kolkata</td>
<td>Rs. 110.00 Lakhs</td>
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<tr>
<td>4</td>
<td>An Integrated Micro-Macro Solidification Algorithm for Direct Numerical Simulation of Large Scale Solidification Structures</td>
<td>General Motors (USA)</td>
<td>Rs. 23.58 Lakhs</td>
</tr>
<tr>
<td>5</td>
<td>Development of a fundamental model for characterizing solidification transport in the mushy region</td>
<td>General Motors, USA</td>
<td>Rs. 38.78 Lakhs</td>
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<tr>
<td>6</td>
<td>Characterization of surface roughness for pressure driven and/or electro-osmotic liquid flow in a micro-channel</td>
<td>DELPHI</td>
<td>Rs. 7.63 Lakhs</td>
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<tr>
<td>7</td>
<td>Genetic Algorithms in hydrocyclones</td>
<td>TATA Steel, Jamshedpur</td>
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<td>8</td>
<td>Plant Noise Control</td>
<td>Tata Metaliks Limited, Kharagpur</td>
<td>Rs. 4.50 Lakhs</td>
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<td>9</td>
<td>Design and Stress Analysis of Cooling Tower Fan</td>
<td>Paharpur Cooling Towers Limited</td>
<td>Rs. 2.30 Lakhs</td>
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<td>10</td>
<td>Technical support on Acoustical Impedance Tube</td>
<td>AIMIL, Bangalore</td>
<td>Rs. 0.50 Lakhs</td>
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<tr>
<td>11</td>
<td>Development of Liquid-Spring Shock Isolation Technology</td>
<td>R&amp;D Engineers Pune, DRDO</td>
<td>Rs. 10.00 Lakhs</td>
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<td>12</td>
<td>Design and Development of mathematical model for ultrafast cooling of steel strips</td>
<td>Tata Steel, Jamshedpur</td>
<td>Rs. 5.61 Lakhs</td>
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<tr>
<td>13</td>
<td>Pressure drop characteristics of Y-type</td>
<td>Sarojini Enterprises, Rs. 0.51 Lakhs</td>
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</table>
and Basket-type strainers Kolkata

14. Experimental sample preparations by wire cut EDM Various clients Rs. 0.87 Lakhs
15. Material Processing by Nd-YAG laser Various clients Rs. 0.86 Lakhs
16. Technology Development of Liquid-Spring based Shock-Isolation System R&D Engineers, DRDO, Pune Rs. 10.00 Lakhs

VISITS ABROAD BY FACULTY MEMBER

1. Dr. Suman Chakraborty Hubmboldt Fellowship (University of Erlangen) (1 month)
2. Dr. Suman Chakraborty Indo-US Project / DST-NSF Project (UIUC and UCI) (1 month)
3. Dr. Suman Chakraborty Invited Speaker (MIT, UC Berkeley) (7 days)
4. Dr. Suman Chakraborty DST-JSPS Project (University of Tokyo) (3 days)
5. Prof. A. R. Mohanty Attend and Chair Session at the 14th International Congress on Sound and Vibration (Cairns, Australia) (July 09-12, 2007)
6. Dr. A. Roy Choudhury Pre-collaborative meeting (Auckland University of Technology, Auckland, New Zealand (December 10-19, 2007)
7. Dr. A. K. Nath Scientific Interaction (CSIR, Pretoria, South Africa) (1 week)
8. Prof. G. L. Datta To attend 111th Metalcasting Congress (Houston, Texas, USA) (May 15-18, 2007)
9. Dr. M. C. Ray To conduct collaborative research (Virginia Polytechnic Institute and State University, Blacksburg, Virginia, USA) (May, 15 – July 15, 2007)

INVITED LECTURES BY FACULTY MEMBERS

1. Dr. Sanjay Gupta Biomechanical Analysis and Design of Orthopaedic Implants (CMERI, Durgapur)
2. Dr. A. K. Nath Recent Advances in Lasers and their applications in Biomedical Implants Processing at Two-Day Workshop on Laser in Biomedical Engineering (Jadavpur University, Kolkata) November 22-23, 2007)
3. Dr. A. K. Nath Some Recent Advancements in Laser Material Processing Applications at WALMI 2008 (Jadavpur University, Kolkata (January 17, 2008)
5. Prof. A. R. Mohanty Noise Control and some of its Industrial Applications (National Institute of
6. Dr. Surjya Kanta Pal  
Soft computing techniques and their applications in Manufacturing (Jalpaiguri Government Engineering College)

7. Dr. D. K. Pratihar  
Soft Computing: An Overview (Siddhartha Engineering College, Vijayawada, AP, India)

8. Dr. D. K. Pratihar  
Design and Development of Adaptive Robot Motion Planner (NIT Rourkela, India)

### THESES (Doctoral and MS)

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
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<tr>
<td>2.</td>
<td>Sudarsan Ghosh</td>
<td>High Efficiency Deep Grinding of Bearing Steel and Modelling for Specific Energy Requirement</td>
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<td>4.</td>
<td>Nirmal Baran Hui</td>
<td>Design and Development of Adaptive Motion Planners for Wheeled Robots</td>
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<td>5.</td>
<td>Debasish Khan</td>
<td>New Conservation Integrals for Circular Arc Crack and Computation a Verification</td>
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<td>6.</td>
<td>Nilotpal Banerjee</td>
<td>Modeling and Dynamics of Railway Vehicles : A Bond Graph Approach</td>
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<td>7.</td>
<td>Suvankar Ganguly</td>
<td>Some Studies on Multi-Phase Transport Phenomena in Multi-Component Alloy Solidification Processes</td>
</tr>
<tr>
<td>8.</td>
<td>Mahesh B. Parappagoudar</td>
<td>Modelling of Moulding Sand Systems Using Conventional Regression Tools and Neural Network-Based Approaches</td>
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<td>9.</td>
<td>Sashi Kanta Panigrahi</td>
<td>Adhesion Failure and Delamination Damage Analyses of Bonded Joints in Laminated FRP Composites</td>
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<td>10.</td>
<td>P. Ramesh Babu</td>
<td>Thermoelastic Analyses of Interlaminar Delamination Growth Behaviour Emanating from Free and Pin-Loaded Holes In Laminated FRP Composites</td>
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<tr>
<td>11.</td>
<td>Arun Kumar Pradhan</td>
<td>Performance of Vertically / Obliquely Reinforced 1-3 Piezoelectric Composites for Active Control of Smart Laminated Composite Structures</td>
</tr>
<tr>
<td>13.</td>
<td>Kate Ramesh Prabhakar</td>
<td>Investigations on External and Internal Hydraulic Jumps</td>
</tr>
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</table>
14. D. S. Nagesh  
   Studies on Modeling of Bead Geometric Parameters in Welding Processes Using Design of Experiments, Artificial Neural Network and Genetic Algorithm

15. Manas Mohan Mahapatra  
   Thermomechanical Finite Element Analyses and Experimental Investigations on Angular Distortions and Weldment Characteristics of Arc Welded Joints

PATENTS GRANTED

1. Prof. R. Maiti  
   Split Cam Design for a Novel Harmonic Drive

2. Prof. R. Maiti  
   An Improved Drive System such as a Two-Gear Epicyclic Drive Similar to Harmonic Drive System

3. Prof. R. Maiti  
   A novel torque amplifier using alternating flow hydraulics and epitrochoid generated rotary piston hydraulic motor principles

4. Prof. R. Maiti  
   A machine for generating a motion to generate internal and external epitrochoids

5. Dr. A. Roy Choudhury  
   5-Axis Curved Layer Fused Deposition Modelling Machine

LAURELS & DISTINCTIONS

1. Dr. Sanjay Gupta  

2. Dr. Suman Chakraborty  
   Swarnajayanti Fellowship Award, Government of India, 2008

3. Dr. Suman Chakraborty  
   Platinum Jubilee Young Scientist Award, National Academy of Science, 2007
DEPARTMENT OF METALLURGICAL & MATERIALS ENGINEERING

HEAD : Professor Nirupam Chakrabarti

FACULTY

Professor :

Chakraborty, Madhusudan
Ph.D. (IIT Kharagpur), Solidification Processing, Scanning Electron Microscopy, Failure Analysis, Metal Matrix Composites

Chakraborti, Nirupam
Ph.D. (University of Washington), Materials Processing, Applications of Genetic Algorithms

Das, Siddhartha
Ph.D. (Illinois University, USA), Mechanical and Physical Metallurgy, Nano Materials, Electron Microscopy, Composite Materials, Surface Engineering

Dhindaw, Brij Kumar
Ph.D. (IIT Kharagpur), Solidification, Steel Technology, Composites

Godkhindi, Mahadev Malhar
Ph.D. (IIT Bombay), Powder Metallurgy, Ceramics

Manna, Indranil
Ph.D. (IIT Kharagpur), Phase transition, Nanostructure materials, Thermodynamic and numerical modeling, Surface engineering by laser and plasma

Pabi, Shyamal Kumar
Ph.D. (IIT Kharagpur), Physical Metallurgy, Materials Science, Nanostructure materials; Modeling; Diffusion

Panigrahi, Sarat Chandra
Dr.Tech.Sc. (Krakow), Metal castng, Composites, Energy cons.

Ray, Kalyan Kumar

Roy, Sanat Kumar

Associate Professor :

Acharya, Narendra Nath
Ph.D. (IIT Kharagpur), Particulate Tech. Multimedia, (metals, non-metal), Modelling (ANN & GA)

Das, Karabi
Ph.D. (Wisconsin University, USA), Physical Metallurgy, Electron Microscopy, Composite Materials, Nano Materials

Dutta Majumdar, Jyotsna
Ph.D. (IIT Kharagpur), Dr.-Ing. (T.U. Clausthal, Germany), Surface Engineering, Laser Materials Processing, Corrosion and surface Protection, Biomaterials, Modelling and simulation, Tribology

Mitra, Rahul
Ph.D. (Northwestern University, USA), Mechanical behaviour of metals, Composite Materials, Internal interfaces of solids, Physical Metallurgy
Roy, Gour Gopal
Ph.D. (IIT Kanpur), Extractive Metallurgy, Materials Processing, Modeling and Simulation

Singh, Shiv Brat
Ph.D. (Cambridge University, UK), Mechanical Metallurgy, Phase Transformation, Physical Metallurgy of Steel

Assistant Professor:

Bhaduri Amit
M.Tech. (IIT Kharagpur), Mechanical Metallurgy, Physical Metallurgy

Biswa, Koushik
Ph.D. (MPI University of Stuttgart, Germany), Powder Metallurgy, Ceramic, Nano materials, structural, functional and bio-ceramic, Modeling-MD, Ab initio, FEM, Tribology

Datta, Bidyut Kanti
Ph.D. (IIT Kharagpur), Powder Metallurgy

Ghosh, Sudipto
Ph.D. (IIT Kanpur), Modeling and simulation, solidification processing, Mechanical Metallurgy

Kundu, Tarun Kumar
Ph.D. (Luleå University of Technology, Sweden), Hydrometallurgy and electrometallurgy, Atomistic simulation, Wet chemistry based material synthesis

Aich, Shampa
Ph.D. (Nebraska-Lincoln, USA), Magnetic Materials, Electronic Materials, Biomaterials, Nano Materials, Rapid Solidification

Visiting Faculty:

Sen, Pradip Kumar
Ph.D. (Jadavpur University), Metallurgical Process Design, Development and Scale-up

Gupta, Debabrata
Ph.D. (University of Arizona, USA), Semiconductor material

Emeritus Professor:

Chatterjee, Uday Kumar
Ph.D. (IIT Kharagpur), Corrosion and Surface Protection, Failure Analysis, Environmental Degradation of Materials

Chair Professor:

Basu Samar
Ph.D., Electrochemistry, Extractive Metallurgy, Rechargeable Battery Technology

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Faculty Appointment:

Dr. Shampa Aich
Assistant Professor

RESEARCH AND DEVELOPMENT

Brief descriptions 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 and Surface Engineering. Synthesis and characterization of nanometric materials both for structural and functional applications is now one of major activities. The research activities are carried out within the framework of either the institute academic curriculum (B. Tech, M. Tech, and PhD level projects) or as sponsored research, development assignments and collaborative studies with outside organizations like educational institutes, R and D laboratories and industries in India and abroad and also as industrial consultancy. The Department has produced 16 B. Techs, 7 Dual Degree M. Techs, 24 M. Techs, 22 PGDST and 13 PhDs, and initiated/continued 8 consultancy and 37 sponsored/collaborative projects during the academic year 2007-2008. The Department is proud to have published 100 research papers in national and international journals and presented 33 conference papers by faculties during 2007-08.

The group working in the field of Extractive Metallurgy has made significant contribution in the area of metal value extraction from sea nodules. Attempt is being made to develop eco-friendly and economically viable process routes to extract the metal values from the sea nodules. Injection metallurgy is predominantly used in the industry to decrease the impurity content of liquid steel/ferro-alloys in a more economical way. Detailed study on design and operating parameters for such high temperature processes is an important issue, and is being studied in the laboratory through physical modeling. Direct reduction of iron ore using mine generated ore and coal fines, is one of the major research areas where the work has been initiated with MHRD project. One of the present research interests also includes the mathematical modeling of fluid flow and heat transfer during welding. Optimization of various design and operating parameters during fusion welding, mathematical modeling of heat transfer during pulsed laser welding that results in low distortion and which has ability to weld heat sensitive components, are also present areas of research in the area of extractive metallurgy. The group has also aligned its activities towards new process development, process modeling & process analysis using state of the art techniques. In new process development, activities have been taken up in the development of eco-friendly processes utilizing low value inputs such as ore & coal fines, pet coke etc. The activities are being extended to waste off gas processing such as flue gas desulphurisation. The expertise of the department includes areas related to dewatering of fine mineral particulates which has an industry focus. Fundamental studies on solid-liquid separation are being carried out to examine the dewatering characteristics of different fine mineral particles like kaoline, calcite and quartz suspensions aided by flocculants and surfactants. Alternatives to conventional processing of mineral/ores are being explored such as single step processing of metallic ores.

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 behavior in several steels. Synergistic characterization of ultrasonic and acoustic signals of in-situ deformation state of metallic materials and investigations related to structure-property relationship of various ceramic and metal-matrix composites, high temperature materials and advanced alloys are some continued thrust areas of activity. Development of metal toughened cutting tool, ceramic and intermetallic matrix composites with ceramic, inter-metallic and metallic reinforcements, 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. Several types of failure analysis remain an attendant part of these activities. In addition, research is in progress in the area of mechanical behaviour of small volume materials.

The major areas in the field of Melting, Casting and Solidification Processing include i) development of cast microalloyed steels, ii) studies on the hot tearing of long freezing range Al alloys, iii) austempered ductile iron through non-conventional route, iv) grain refinement of Al alloys and v) development of cast metal matrix composites. The group involved in the grain refinement of Al alloys has been successful 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. The department has transferred a technology of manufacturing Al-B, Al-Ti and Al-Ti-B master alloys to an industry for commercial production of the same. In the area of solidification processing, the main focus is on the understanding of the particle engulfment and pushing during solidification in continuous casting. Basically the issues of inclusions redistribution in the continuous cast ingots have been characterized. Heat transfers in the hot metal ladles have been modeled with a view to examine the feasibility of setting up of satellite foundries. The models have also been experimentally validated.

The major thrust in the area of Physical Metallurgy, and in particular, concerning phase transformation activities lies in synthesis and structural characterization of nanocrystalline materials prepared by planetary ball milling. High specific strength alloys are of immense interest to aviation, automobile, defense and several other strategic industries. A novel series of Al alloys (Al65Cu20TM15 and Al50TM40Si10, where TM = Ti/Nb/Zr) has been developed that possess extraordinarily high compressive strength (1500-1950 MPa), Young’s modulus (130-160 GPa), fracture toughness (3.4±0.8 MPa√m) and hardness (7.5-8.8 GPa) and measure up to 2-3 times greater strength than age hardenable (crystalline) Al-alloys (< 600 MPa) and compare well with maraging steel in strength but at a much lower density (~ 3.5 Mg/m³). The novelty of these alloys lies in the unique microstructure and phase aggregate that evolve through precipitation of nano-metric intermetallic phases (Al3Ti, Al4Cu9, Al5Cu and Al5CuTi2, Ti2Si3, etc.) in amorphous matrix by annealing after mechanical alloying (MA) under ambient condition using high energy planetary ball milling, or by partial amorphization during MA itself. Combination of transient heating and pressing strategies based on spark plasma or high pressure (2-8 GPa) sintering seems effective in consolidating mechanical alloyed powder mass in solid/bulk components without destroying the nanocrystalline + amorphous composite aggregate.

Some other notable achievements of this group include synthesis of nanocrystalline Ni-Si, Fe-Si, Nb-Al, Cu-Al, Ni-Al and several other ternary systems, identification of the sequence of phase formation during their synthesis by mechanical alloying and development of new kinetic models for mechanical alloying to evolve some relation of the alloying rate with the melting temperature of the corresponding system. Recently, it has been demonstrated that a number of early transition metals (Nb, Ti, Zr) undergo polymorphic changes following nanocrystallization. Thermodynamic analysis based on equation of state shows that the structural instability due to negative hydrostatic pressure consequent upon nanocrystallization (below a critical grain size) and/or high strain rate deformation is responsible for such change in crystal structure.

In addition to the above, the mechanism of recrystallization and texture development in
aluminium alloys for packaging purpose was studied in details. A low-Mn unalloyed 
austempered ductile alloy has been developed for structural components in excavator and 
earth moving equipments by appropriate experiment, characterization and modeling exercise 
to optimize the austenitization and austempering process window.

It was demonstrated that laser surface hardening, unlike alloying/melting, of austempered 
ductile iron could significantly enhance hardness and wear resistance due to residual 
compressive stress on the surface developed by martensitic transformation instead of liquid-
solid ledeburitie transformation. In addition, the detailed crystallography of Cr-rich M23C6 
precipitates in quenched and aged austenitic stainless steels has been determined and the 
importance of localized residual stress developed due to quenching on the nucleation and 
growth of these precipitates has also been established.

The present activities of Powder Metallurgy group include synthesis of particulate 
reinforced mullites and their property evaluation, production of Al2O3 reinforced Ni3Al 
through 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. 
Work has also been initiated towards production and sintering behavior of nanocrystalline 
titanium powder, nanocrystalline ferritic and stainless steel powder. In addition, a method of 
consolidating elemental tungsten to bulk components for high temperature applications by 
sintering nanostructured powder at relatively low temperature of 1700° C has been developed.

Research on Composite Materials hold a very prominent position in the department, and 
involves processing by casting, conventional and advanced powder metallurgy routes, such 
as reactive milling and sintering. Fundamental research is in progress in the direction of 
understanding the microstructure-property relationships, characteristics of matrix-
reinforcement interfaces and mechanical behaviour. Research involves the development of 
in-situ Al-Al2O3, Al-MgAl2O4, Al-TiC and Al-TiB2 composites by casting route and studies 
of mechanical properties. In addition, SiCp reinforced Al-Li/ Mg-Li alloy based metal matrix 
composites have been developed by infiltration technique, where the understanding of the 
particle engulfment and pushing during solidification processing has been applied. 
Significant progress has been made in studies on interface reaction kinetics and tailoring of 
interfaces to control formation of detrimental reaction products. Research on metal matrix 
composite materials also includes systems having age-hardenable Al-alloys and Zn-Al alloys 
as matrices, and reinforcements of varying sizes.

Besides, the mechanical behavior of ceramic and intermetallic matrix composites is being 
studied, with emphasis on structure-property correlations and mechanisms of deformation 
and fracture. Dispersion of ductile phase in molybdenum and niobium silicides has resulted 
in improved damage tolerance, keeping the high temperature strength and oxidation 
resistance satisfactory. Ceramic matrix composites have been evaluated with focus on 
applications in cutting tools, as well as aerospace components including nose-cone tiles for 
hypersonic vehicles.

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 mechanism, defect structures of compounds, 
transport properties of different species, adhesion and protective properties of the scales. 
Performance of different types of coatings as a protective device is also an area of
investigation. Studies on high temperature oxidation behavior of multi-phase refractory metal-silicides like Molybdenum and Niobium Silicides are in progress. **Surface Engineering** is one of the major thrust areas of research in the department. 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. It has been demonstrated that laser surface alloying of the near surface region of engineering components (of stainless steel, copper and titatium based alloys can significantly improve the resistance to wear, corrosion, oxidation and similar surface dependent degradation. Plasma immersion ion implantation (PIII) and sputtering facilities have been installed (through a DST sponsored project) in this Department capable of implantation under negatively biased pulses with high frequency from a RF coupled plasma of gaseous species (nitrogen, oxygen, etc.) of metallic and semiconductor materials and metallic coating. This facility allows simultaneous implantation and diffusion at temperature up to 500°C. Currently, this facility is being utilized for enhancing hardness and wear-resistance of steel and selected non-ferrous alloys. **Surface engineering of bio-implants** using laser and plasma assisted surface engineering is of major focus, where Ti-6Al-4V and Mg- alloys are surface treated to improve wear and corrosion resistance properties.

**Laser and electron beam assisted materials processing** are advanced manufacturing technique where, high power laser beam and electron beam are used as a source of heat to manufacture finished/semi-finished components by cutting, welding, surface modification and rapid manufacturing. An extensive experimental research is carried out in the Dept. (in collaboration with Bhaba Atomic Research Centre, Centre for Advanced Technology, University of Manchester and University of Clausthal) on laser assisted welding, bending, surface modification and direct laser cladding of commercial metals/alloys and metal matrix composites. An electron beam facility would be soon developed in collaboration with the Dept. of mechanical engineering and BARC Bombay dedicated for the welding of ‘difficult to weld’ similar and dissimilar metals/alloys.

**Nano-Science and Technology** is one of the thrust areas where, the Department is taking leading role in expanding research in development of novel-nanostructured materials for gas sensor, hydrogen storage and solid oxide fuel cell applications. A recent innovation in this regard concerns ‘**nanofluid**’ that comprises uniform and stable colloidal dispersion of insignificant amount (< 1 vol. %) of nanometric solids (metallic / ceramic) in common heat transfer fluids (water/ethylene glycol). Nanofluids offer a phenomenal increase in thermal conductivity (50-150 %) and heat transfer coefficient (15-25 %). Besides developing nano-\( \text{Al}_2\text{Cu}/\text{AlAg}_2 \) dispersed nanofluid for the first time, this group has identified the major parameters (composition/bonding, volume percent, size, and shape of nanoparticles) and mechanism that influences this extraordinary enhancement.

Development of **Lithium Ion Battery (LIB) Technology** for applications in Electric Vehicles in India has taken a prominent research area in the Department, as a part of multi-institution project from the Government of India. An important focus of the project is on the development of new, more efficient and cheaper materials for creating the next generation of LIBs, which would enable India to create a stake in this emerging area of energy storage. LIB Technology is considered as the third generation energy storage technology after the Lead-Acid and the Nickel-Cadmium battery technologies. Its superiority over the two other previous generation technologies has been demonstrated by higher volumetric & gravimetric energy densities, higher shelf life, and temperature range of operation. It is expected that within the next 10 years almost 50% of all portable power sources will be based on the LIB
Technology. The focus of research is on developing new, better, more efficient, and cheaper anode, cathode and electrolyte materials to create the next generation of products.

**Thrust Areas:**

In addition to the above, work has been initiated in the following thrust areas:

1. Biomaterials
2. Nanostructured Material
3. Virtual Alloys
4. Laser Materials Processing
5. Plasma Ion Implantation
6. Plasma Sprayed Coating
7. Functionally Graded Materials
8. Intermetallics
9. In-Situ Composites
10. Solidification under microgravity
11. Synthesis of fine ceramics
12. Process Modeling
13. Special grade steels
14. Aluminium Packaging Alloys
15. Lithium Ion Battery
16. Nano-intermetallic dispersed amorphous Al-matrix composites

**New Acquisitions:**

1. LECO LV700 Vickers Hardness Tester
2. RF & DC Magnetron Sputtering System KVS-T4065 (for Arun Sarin Lab)
3. UHV E-Beam Evaporator System KVE-T4065820 (for Arun Sarin Lab)
4. Dektak 150 Surface Profile Measuring System (for Arun Sarin Lab)
5. INSTRON ElectroPuls (TM) E1000 Electrodynamic Test Instrument (for Arun Sarin Lab)
6. Buehler Isomet Slow Speed Precision Saw
7. Struers Tenupol 3
8. Fretting wear tester (DUCOM, Bangalore)
9. PSM 1735 Impedance analyzer LCR meter (Newton's 4th, UK)
10. Vickers Hardness Tester (Model: LECO LV-700L) from LECO Corporation, St. Joseph, MI 49085, USA

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects:**

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Evaluation of Manganese Nodules extraction processes for optimal performance: A new Approach.</td>
<td>Ministry of Earth Sciences, Govt. of India</td>
<td>Rs. 17.25 Lakhs</td>
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<tr>
<td>2</td>
<td>Feasibility Study for extraction of Maharashtra</td>
<td>State</td>
<td>Rs. 7.294 Lakhs</td>
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</tbody>
</table>
3. Synthesis and properties of electrodeposited Nickel / Ceria nano composites  
   Indian rare Earth Limited (IREL)  
   Rs. 27.90 Lakhs

4. Mechanosynthesis and mechanical-thermal synthesis of in-situ aluminium based nanocomposites and their characterization  
   DST, New Delhi  
   Rs. 43.15 Lakhs

5. Nanoscale Developments in a Co-based Heusler Type CoNiGa Ferromagnetic Shape Memory Alloy  
   IIT Kharagpur  
   Rs. 3.52 Lakhs

   IIT Kharagpur  
   Rs. 5.00 Lakhs

7. Versatile nano Zirconia production facility at Indian Rare Earths Limited, OSCOM  
   IRELTDC, DAE  
   Rs. 44.856 Lakhs

8. Effect of rare earth elements on isothermal and cyclic oxidation behavior of Niobium and Molybdenum silicide based alloys  
   DRDO, New Delhi  
   Rs. 14.31 Lakhs

9. Development of Niobium Silicide based alloys and composites for elevated temperature applications  
   DRDO, New Delhi  
   Rs. 32.41 Lakhs

10. Mathematical modeling of solidification behavior of weld pool and oxidation characteristics of the zones of weldment during laser welding of plain carbon steels  
    DST, New Delhi  
    Rs. 22.70 Lakhs

11. Structure-Property Relations In Ceramic Composites For High Temperature Applications In Nose Cone Tiles In Hypersonic Vehicles  
    DRDL  
    Rs. 72.96 Lakhs

12. Development of high temperature oxidation resistant tungsten based bulk refractory alloys through mechanical alloying route  
    DRDO  
    Rs. 27.30 Lakhs

    DST, New Delhi  
    Rs. 279.51 Lakhs

14. Physico-Chemical Analysis of Metal Based Ayurvedic Bhasma Drugs by Sophisticated Modern Instrumental Methods  
    DST, New Delhi  
    Rs. 20.35 Lakhs

15. Simulation and Fabrication of CVD/CVI set up for Ceramic Matrix in general and Reinforced Graphite matrix Composites in Particular  
    DRDO  
    Rs. 13.70 Lakhs
<table>
<thead>
<tr>
<th>No.</th>
<th>Project Title</th>
<th>Implementing Agency</th>
<th>Funding Amount</th>
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<tr>
<td>16.</td>
<td>Thermal stress modeling and design of twin roll caster to obtain thin alloy sheet with extremely fine / amorphous structures</td>
<td>DST, New Delhi</td>
<td>Rs. 37.53 Lakhs</td>
</tr>
<tr>
<td>17.</td>
<td>Semi-Solid Processing of Al and Mg Base Alloys Under Low Convection Conditions</td>
<td>CSIR, New Delhi</td>
<td>Rs. 10.70 Lakhs</td>
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<tr>
<td>18.</td>
<td>Synthesis and characterization of in-situ carbide reinforced austenitic manganese steel matrix composites</td>
<td>Naval Research Board, New Delhi</td>
<td>Rs. 27.92 Lakhs</td>
</tr>
<tr>
<td>19.</td>
<td>STEEL TECHNOLOGY CENTRE</td>
<td>Ministry of Steel, New Delhi &amp; DST, New Delhi</td>
<td>Rs. 2025.864 Lakhs</td>
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<tr>
<td>20.</td>
<td>Development of nano-crystalline intermetallics and nanocomposites</td>
<td>DRDO</td>
<td>Rs. 36.09 Lakhs</td>
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<tr>
<td>21.</td>
<td>Nano Science and Technology</td>
<td>IIT Kharagpur</td>
<td>Rs. 5.00 Lakhs</td>
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<tr>
<td>22.</td>
<td>Development of high energy density lithium ion battery technology</td>
<td>RCI, Hyderabad</td>
<td>Rs. 780.35 Lakhs</td>
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<td>23.</td>
<td>Analysis of oxide materials for rechargeable lithium ion batteries using genetic algorithm</td>
<td>RCI, Hyderabad</td>
<td>Rs. 20.88 Lakhs</td>
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<td>24.</td>
<td>Estimation of mechanical properties of monolayered materials through molecular dynamic simulation and validation of the work using literature data</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
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<tr>
<td>25.</td>
<td>Development and characterization of novel nanocrystalline metallic / ceramic based hydrogen sensor materials</td>
<td>MHRD, New Delhi</td>
<td>Rs. 15.00 Lakhs</td>
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<td>26.</td>
<td>Synthesis and characterization of Al-based amorphous and nanocrystalline composites</td>
<td>DST, New Delhi</td>
<td>Rs. 3.01 Lakhs</td>
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<tr>
<td>27.</td>
<td>Development of nanocrystalline coating by combined plasma assisted implantation and deposition</td>
<td>DST, New Delhi</td>
<td>Rs. 50.814 Lakhs</td>
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<tr>
<td>28.</td>
<td>Development and characterization of copper based Brazing alloy by rapid solidification and mechanical alloying</td>
<td>ISRO-IIT Cell</td>
<td>Rs. 2.20 Lakhs</td>
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<tr>
<td>29.</td>
<td>Development of multifunctional surface on Ti and its alloys for tailoring wear resistance and biocompatibility</td>
<td>CSIR, New Delhi</td>
<td>Rs. 9.46 Lakhs</td>
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<td>30.</td>
<td>Steel Technology centre - a bridge project</td>
<td>IIT Kharagpur</td>
<td>Rs. 5.00 Lakhs</td>
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<tr>
<td>31.</td>
<td>Solvent extraction studies for high value metals by ionic liquids, in mixer-settler unit: Experimentation and molecular Modelling</td>
<td>IIT Kharagpur</td>
<td>Rs. 4.15 Lakhs</td>
</tr>
</tbody>
</table>
33. High speed laser synthesis of amorphous surface structure
   DST, New Delhi Rs. 6.57 Lakhs
34. Formability and coating behaviour of TRIP aided steels
   DST, New Delhi Rs. 8.44 Lakhs
35. Development and characterization of Nanostructured Thin Films for SiGe Quantum Well Infrared Photodetector and Ferroelectric based Gas / Chemical Sensors
   DRDO Rs. 200.20 Lakhs
36. Establishment of an Advanced Research Facility for EB Welding and Process Development Related to Programs of Interest to DAE
   BRNS & DAE, Govt. of India Rs. 133.00 Lakhs
   Indira Gandhi Centre for Atomic Research, Kalpakkam Rs. 19.00 Lakhs
38. Thermal Performance of Nanofluid Based Cooling Systems
   Delphi Automotives Systems Pvt. Ltd., Bangalore -
39. Establishment of an Advanced Research Facility for EB Welding and Process Development Related to Programs of Interest to DAE
   BRNS & DAE, Govt. of India Rs. 133.00 Lakhs

Consultancy Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Chemical analysis of TMT steel bars</td>
<td>National Highway Authority</td>
<td>Rs. 1.00 Lakhs</td>
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<tr>
<td>2.</td>
<td>Setting up a research and development center for Damodar Valley Corporation at Kolkata (Phase I)</td>
<td>Damodar Valley Corporation at Kolkata</td>
<td>Rs. 2132.00 Lakhs</td>
</tr>
<tr>
<td>3.</td>
<td>Failure analysis of boiler tubes</td>
<td>Damodar Valley Corporation</td>
<td>Rs. 0.70 Lakhs</td>
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<tr>
<td>4.</td>
<td>Failure analysis of welded pipeline</td>
<td>Essar Steel Limited</td>
<td>Rs. 0.30 Lakhs</td>
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<td>5.</td>
<td>Development of air cooled microalloyed steel with improved toughness for forging applications</td>
<td>Ashok Leyland</td>
<td>Rs. 12.00 Lakhs</td>
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<td>6.</td>
<td>Plasma/Microwave coating</td>
<td>Tata Steel</td>
<td>Rs. 2.19 Lakhs</td>
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<td>7.</td>
<td>Genetic Algorithms in Hydrocyclones</td>
<td>Tata Steel</td>
<td>Rs. 5.00 Lakhs</td>
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<td>8.</td>
<td>Development of new metallic coating for low carbon steels –Phase-II</td>
<td>Tata Steel</td>
<td>Rs. 2.50 Lakhs</td>
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<td>9.</td>
<td>Plate cooling efficiency of nanofluid for automobile applications</td>
<td>DELPHI, Bangalore</td>
<td>-</td>
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</table>

VISITS ABROAD BY FACULTY MEMBER

1. Prof. Siddhartha Das Guest Professor (University of Ulm, Germany)
2. Dr. Gour Gopal Roy
To present an invited lecture at EMRS Conference (Poland) September 2007

3. Dr. Rahul Mitra
Visiting Professor (Department of Chemical Engineering and Materials Science, University of Southern California) January 01 – May 15, 2008

4. Prof. Kalyan Kumar Roy
To deliver an invited lecture and to chair a technical session at the International Conference, AMME (Cairo, Egypt) (May 26 – June 02)

5. Prof. Nirupam Chakraborti
Keynote Lecture at IPDO 2007 (Miami, USA)

6. Prof. Nirupam Chakraborti
Invited Lecture at EMRS 2007 (Warsaw, Poland)

7. Prof. Nirupam Chakraborti
Guest Researcher (Ames Laboratory, USA)

8. Prof. Madhusudan Chakraborti
Collaboration between IIT Kharagpur and Georgia Tech in the area of Materials Design and Development (Woodruff School of Mechanical Engineering, Georgia Institute of Technology Atlanta USA) May–June 2007

9. Prof. Madhusudan Chakraborti
Collaboration in the area of biofuels and neglected diseases (University of California Berkeley) July 09

10. Prof. Madhusudan Chakraborti
To attend Global PANIIT Meet (San Francisco, California, USA) July 04–08

11. Prof. Indranil Manna
To initiate a tri-nation internation collaboration among India-Brazil-South Africa (IBSA) initiative on ‘Nanotechnology’ as a part of Government of India (DST) delegation (South Africa) November 2007

12. Prof. Indranil Manna
Visiting Professor for independent research on deformation behavior of bulk metallic glass under Euro-Space agency project (University of Ulm, Germany) May–July 2007

13. Prof. Indranil Manna
To deliver an invited lecture and explored collaboration on Mg-alloy technology (Institute for Mater. Res., GKSS, Geesthacht, Germany) May–July 2007

14. Prof. Indranil Manna
To deliver invited lectures and initiate collaborative research on nanomaterials (Department of Mater. Engg., Monash University, Clayton, Australia and School of Engineering, University of Queensland, Australia) October 03–07, 2007

15. Prof. Indranil Manna
In connection with Indo-Polish (DST-KBN) collaborative project and to deliver invited lecture in EMRS conference (Warsaw, Poland) August 2007

16. Dr. Jyotsna Dutta Majumdar
As a visiting faculty (Department of Materials Science, University the Chile, Santiago)
1. Prof. Pradip Kumar Sen  
   “Sea Nodules Processing-status review for commercialization” (International Sea Bed Authority, United Nations, Chennai)

2. Prof. Uday Kumar Chatterjee  
   Corrosion and corrosion protection (Tata Steel, Jamshedpur)

3. Prof. Sarat Chandra Panigrahi  
   Invited Lecture: National Seminar on Advancement of IT - Its role for protection of environment (Bhubaneswar)

4. Prof. Sarat Chandra Panigrahi  
   Invited Lecture: National Seminar on Impact Assessment of Alternate Energy Sources (Bhubaneswar)

5. Prof. Sarat Chandra Panigrahi  
   Invited Lecture: International Workshop on mesoscopic, nanoscopic and microscopic materials (Bhubaneswar)

6. Prof. Sarat Chandra Panigrahi  
   Invited Lecture: International Conference on Science and Spirituality for World Peace (Imphal)

7. Prof. Sarat Chandra Panigrahi  
   Invited Lecture: National Seminar on Science and Engineering of Composite Materials (Jadavpur University, Kolkata)

8. Prof. Sarat Chandra Panigrahi  
   Teaching and Learning Engineering (GIET, Gunupur)

9. Dr. Rahul Mitra  
   Invited Lecture: Tough Molybdenum and Niobium Silicide Based Intermetallic Alloys with High Temperature Strength (Indian Institute of Metals, Mumbai)

10. Dr. Gour Gopal Roy  
    Application of Genetic Algorithm (GA) to estimate the rate parameters for reduction of iron ore-grap (Warsaw University, Poland)

11. Prof. Kalyan Kumar Roy  
    The vision of fracture toughness assessment of structural materials for quality control at the manuf (Cairo, Egypt)

12. Prof. Kalyan Kumar Roy  
    Significance of micro and meso-scale physical phenomena on the reliable analysis of structural integ (Udaipur, India)

13. Prof. Kalyan Kumar Roy  
    Microstructure, Mechanics and Mechanism in the Development of Advanced Structural Materials (Kalpakkam, India)

14. Prof. Brij Kumar Dhindaw  
    Invited Lecture: IUMRS (IISC., Bangalore)

15. Prof. Brij Kumar Dhindaw  
    Advanced Materials (Trivandrum)

16. Prof. Brij Kumar Dhindaw  
    From primitive huts to Advanced Boeing A - 380 and Evolution of Metal Casting as Advanced Science & Technology (VIT University)

17. Prof. Nirupam Chakraborti  
    Keynote Lecture at IPDO 2007 (Miami, USA)

18. Prof. Nirupam Chakraborti  
    Invited Lecture at EMRS 2007 (Warsaw, Poland)

19. Prof. Nirupam Chakraborti  
    Genetic Algorithms Lecture Series (Ames Laboratory, USA)
<table>
<thead>
<tr>
<th>No.</th>
<th>Presenter</th>
<th>Title/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Prof. Nirupam Chakraborti</td>
<td>Plenary Lecture, NGMS 2008 (Kolkata)</td>
</tr>
<tr>
<td>21</td>
<td>Prof. Madhusudan Chakraborti</td>
<td>Development of aluminium alloy based in situ metal matrix composites (Georgia Institute of Technology, Atlanta, USA)</td>
</tr>
<tr>
<td>22</td>
<td>Prof. Madhusudan Chakraborti</td>
<td>Scope for Collaboration with IIT Kharagpur (Georgia Institute of Technology, Savannah, USA)</td>
</tr>
<tr>
<td>23</td>
<td>Prof. Indranil Manna</td>
<td>Evolution of microstructure and properties in austempering and laser surface hardening of bearing steel An invited talk in Microstructure and Texture in Steel (MATS 2008), an International Conference held in (Jamshedpur)</td>
</tr>
<tr>
<td>24</td>
<td>Prof. Indranil Manna</td>
<td>“Science and Technology of Nano-dispersed Solid Alloys and Thermal Fluids”, An invited lecture delivered at the National Seminar on ‘In search of advanced materials’ under TEQIP programme (NIT Durgapur)</td>
</tr>
<tr>
<td>25</td>
<td>Prof. Indranil Manna</td>
<td>“Science and Technology of Nano-dispersed Solid Alloys and Thermal Fluids”, An invited talk delivered at the National Conference on Nanomaterials and Nanotechnology (Lucknow University)</td>
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<td>26</td>
<td>Prof. Indranil Manna</td>
<td>“Science and Technology of Nano-dispersed Solid Alloys and Thermal Fluids”, An invited talk delivered at the National Conference ‘Bangalore NANO 2007’ (Bangalore)</td>
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<tr>
<td>27</td>
<td>Prof. Indranil Manna</td>
<td>“Science and Technology of Nano-dispersed Solid Alloys and Thermal Fluids”, An invited talk delivered at the National Theme Meeting on Nanoceramics and Nanocomposites (IIT, Kanpur)</td>
</tr>
<tr>
<td>28</td>
<td>Prof. Indranil Manna</td>
<td>“Science and Technology of Nano-dispersed Solid Alloys and Thermal Fluids”, An invited talk (Department of Materials Engineering, Monash University, Clayton, Australia)</td>
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<tr>
<td>29</td>
<td>Prof. Indranil Manna</td>
<td>“Science and Technology of Nano-dispersed Solid Alloys and Thermal Fluids”, An invited talk (in the School of Engineering, University of Queensland, Australia)</td>
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<tr>
<td>30</td>
<td>Prof. Indranil Manna</td>
<td>“Thermal properties of nanometric-metal / ceramic dispersed water and ethylene glycol based nanofluid”, An invited talk delivered at the National Conference ‘Bangalore NANO 2007’ (Bangalore)</td>
</tr>
<tr>
<td>31</td>
<td>Prof. Indranil Manna</td>
<td>“Thermal properties of nanometric-metal / ceramic dispersed water and ethylene glycol based nanofluid”, An invited talk delivered in the European Materials Research Society (E-MRS) Fall Meeting (Symposium K) (Warsaw, Poland)</td>
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</tbody>
</table>
32. Prof. Indranil Manna  “Thermal properties of nanometric-metal / ceramic dispersed water and ethylene glycol based nanofluid”, An invited talk delivered at the National Workshop on Nanoscience and Biochips (Nano-Bio 2007) (Indian Statistical Institute, Kolkata)

33. Prof. Indranil Manna  “Thermal properties of nanometric-metal / ceramic dispersed water and ethylene glycol based nanofluid”, An invited talk delivered at the International Conference on Advanced Materials and Composites (Mascot Hotel Convention Centre, Trivandrum)

34. Prof. Indranil Manna  ‘Synthesis and Characterization of Nanostructured SnO2 or BST Based Gas-Sensors’ delivered in South Africa, under the India-Brazil-South Africa (IBSA) tripartite collaboration.

35. Dr. Jyotsna Dutta Majumdar  “Laser Surface Engineering of Ti-6Al-4V for Orthopedic Application” at the Workshop on Application of Lasers in Materials Processing’ (Kolkata)


37. Dr. Jyotsna Dutta Majumdar  “Laser Materials Processing Activities in India” delivered at the Workshop on ‘Areas of Common Interest between EU and Developing Countries in the field of Laser Technology’ (Cairo, Egypt)

38. Dr. Jyotsna Dutta Majumdar  “Surface Engineering of Copper and its Alloys for Wear Resistance Application” (University of Chile, Santiago)

39. Dr. Jyotsna Dutta Majumdar  “Studies on Copper Based Shape Memory Alloy for Seismic Application” (Department of Materials Science, University of Chile, Santiago)

**LECTURE BY VISITING EXPERT**

1. Dr Sujoy Kar  General Electric Global Research Center, Bangalore  Microstructure Evolution and Thermodynamic Modeling

2. Dr Arup Dasgupta  Physical Metallurgy Division, IGCAR, Kalpakkam  TEM Studies on SiC Thin Films and solar cells prepared by HWCVD technique

3. Dr. Sharmila M. Mukhopadhyay  Nanoscale modification of complex solids at
4. Prof. Dr. B L Mordike
   Technical University of Clausthal
   Germany
   Laser Material Processing

5. Prof. Dr.-Ing. W. Bleck
   Department of Ferrous Metallurgy
   RWTH Aachen University, Germany
   Benefits of the TRIP Effect for High Strength Sheet Steels

6. Dr. P. P. Bhattacharjee
   Department of Adaptive Machine Systems
   Graduate School of Engineering
   Osaka, Japan
   Development of Cube Texture in Nickel Base Substrate Tapes for Coated Superconductor Applications

7. Dr. Neil John Coville
   DST/NRF Centre of Excellence in Strong Materials and School of Chemistry
   University of the Witwatersrand
   Johannesburg, South Africa
   Shaping carbon

8. Prof. Govind Gupta
   Department of Metallurgy
   Indian Institute of Science, Bangalore
   Study of the dropping zone of a blast furnace

THESES (Doctoral and MS)

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
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<tbody>
<tr>
<td>1.</td>
<td>R. N. Maiti</td>
<td>Hydrodynamics of Trickle Bed Reactors</td>
</tr>
<tr>
<td>2.</td>
<td>T. Gnanadurai</td>
<td>Synthesis and Characterization of Aluminium Matrix Micro and Nano Composites Reinforced by in-situ Alumina Particulates</td>
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<tr>
<td>3.</td>
<td>Golap Mohammad Chowdhury</td>
<td>Some Studies on reduction kinetics of iron ore-graphite composite pellets in a packed bed reactor</td>
</tr>
<tr>
<td>4.</td>
<td>Mervin A. Herbert</td>
<td>Some studies on the mushy state rolling of Al-4.5Cu alloy based in-situ composites reinforced with TiB2 or TiC particles.</td>
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<tr>
<td>5.</td>
<td>Kausik Chattopadhyay</td>
<td>Structure-Property Relationships in Nb-Si-Mg Alloys.</td>
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<tr>
<td>6.</td>
<td>Subhrangshhu Moitra</td>
<td>Optimization of hot rolling using genetic algorithms</td>
</tr>
<tr>
<td>7.</td>
<td>Animesh Mandal</td>
<td>Studies on the synthesis and characterization of Al based in-situ composites reinforced with TiB2 particles.</td>
</tr>
</tbody>
</table>
8. Sashank Shekhar Nayak  Synthesis and characterization of nano-crystalline intermetallics and nano composites of Al-TM (TM=Ti, Zr, Fe) alloys prepared by nano-equilibrium processing routes.


10. Anil Kumar Verma  Kinetics of diffusional phase transformation and microstructure evolution during galvannealing.

11. K. G. Basav Kumar  Influence of melt treatments on mechanical properties, sliding wear and machinability of Al-Si alloys.

12. V. M. Sreekumar  On the formation of magnesium aluminate spinels in-situ in molten Aluminium-Magnesium alloys mixed with silica particles.

13. B. Ramesh Chandra  Studies on Laser Assisted Composite Surfacing of Commercial Metal and Alloys

14. K. Ram Mohan Rao  Surface modification of metallic materials by plasma immersion ion implantation for enhancement of hardness and corrosion resistance

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BOOK PUBLISHED

<table>
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<th>Name of the Author(s)</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
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<tbody>
<tr>
<td>1</td>
<td>Prof. Pradip Kumar Sen</td>
<td>Management of Innovation, contributory chapters on:</td>
<td>Department of Scientific and Industrial Research, Government of India</td>
<td>2008</td>
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<td></td>
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<td>Chapter 4 : Strategic Role Innovation in Business</td>
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<td>Chapter 5 : The Process Sourcing Innovation</td>
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<td>Chapter 6 : Selecti Innovation Options</td>
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<td>Chapter 7 : Development of Innovation Strategy with reference to Industrial research</td>
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</table>

PATENTS GRANTED

1. Dr. Rahul Mitra  Reaction hot pressing technique for processing of Ti5Si3 based materials (Granted, Ref. : 197166)

LAURELS & DISTINCTIONS

1. Prof. P. K. Sen  Nominated to the Research Board of Indian
2. Prof. P. K. Sen  Rare Earths Limited, Mumbai, DAE
   Nominated as Member, Standing Committee on non-living marine resources, Ministry of Earth Sciences, Government of India

3. Prof. Sanat Kumar Roy  Received the Best paper presentation award at the International seminar on Mineral Processing and Technology-2008, held at Thiruvanthapuram, Kerala

4. Prof. Mahadev Malhar Godkhindi  Awarded Prof. G. S. Tendolkar best paper award during annual conference of PMAI 2007, New Delhi

5. Prof. Sarat Chandra Panigrahi  Became Member, Academic Council NIFFT, Ranchi

6. Prof. Sarat Chandra Panigrahi  Syllabus Committee for Metallurgical and Materials Engineering, BPUT

7. Prof. Kalyan Kumar Roy  Became Advisory Member of the Editorial Board : Transactions of the Indian Institute of Metals, Published by Indian Institute of Metals (2007)


9. Dr. Karabi Das  Judged as Outstanding (Top 20%) Reviewer by the Metallurgical and Materials Transactions A, 2007

10. Prof. Madhusudan Chakraborty  Appointed as Member Board of Governor, NIT Rourkella (January 2008)

11. Prof. Indranil Manna  Fellow (FASc), Indian Academy of Sciences (IAS), Bangalore, elected in 2008

12. Prof. Indranil Manna  INAE-AICTE Distinguished Industry Professor (2007), awarded by the Indian National Academy of Engineering jointly with Tata Steel, Jamshedpur

13. Prof. Indranil Manna  Member, National Advisory Committee, MATS-2008 and ISCS-2008 (two international conferences organized by Tata Steel; ICAMT-2008, ICONSAT-2008 organized by IGCAR+INAE

14. Prof. Indranil Manna  Member, Research Council, NML, Jamshedpur (2007-2009)

15. Prof. Indranil Manna  Member, Editorial Board of STEEL TECH, a bi-monthly bulletin on Steel published by Tata Steel


17. Prof. Indranil Manna  Council Member, Indian Institute of Metals, for 2007-2008. Also, In-charge for IIM web site (www.iim-india.net)

18. Prof. Indranil Manna  Member, Board of Editors, Computers,
20. Dr. Jyotsna Dutta Majumdar  
Member, National Academy of Science, Allahabad, India

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

1. GAMS 2008, Warsaw, Poland  
September 17–20, 2007

2. NGMS 2008, Kolkata  
January 9–11, 2008

3. COMPOSIT (Congress of Metallurgical Professionals involving Students, Industry and Teachers); a national meet conducted by the Society of Metallurgical Engineers, Department of Metallurgical and Materials Engineering, Indian Institute of Technology Kharagpur  
March 29–31, 2008
DEPARTMENT OF MINING ENGINEERING

HEAD : Professor Jayanta Bhattacharya

FACULTY

Professor :

Bhattacharya, Jayanta Ph.D.(IIT Kharagpur), Reliability and Quality Engineering
Bhattacherjee, Ashis Ph.D.(Penn State), Operations Research, Occupational Health and Safety
Das, Samir Kumar Ph.D.(ISM Dhanbad), Coal Mining, Mine Safety, Ground Control, Powered Roof Support, Mining Environment, Rock Mechanics, Mining Legislation
Mukhopadhyay, Subir Kumar Ph.D.(IIT Kharagpur), Subsurface Metalliferous Mining, Mine Planning and Design, Open Pit Mining, Mine and Mineral Economics, Small Scale Mining, Mine Safety
Pathak, Khanindra Ph.D.(London University), Mining Machinery, Surface Mining, Mine Closure Planning, Environmental Management, Geoinformatics & Remote Sensing
Rao, Karanam Uma Maheshwar Ph.D.(IIT Kharagpur), Rock Mechanics, Underground Metal Mining Methods
Sastry, Bhamidipati Suryanarayana Ph.D.(Utah), Mine Environment

Associate Professor :

Deb, Debasis Ph.D.(Alabama University, USA), Rock Mechanics, Numerical Methods, GIS, AI
Pal, Samir Kumar Ph.D.(IIT Kharagpur), Mining Mechanization, Rock Mechanics & Ground Control Geomatics

Assistant Professor :

Chakravarty, Debashish Ph.D. (IIT Kharagpur), Rock mechanics, Blasting & Ground Control, Applied DIP & DSP, Advanced Surveying, GIS & GPS, Numerical Analysis, AI and Virtual Reality, Geomatics & Geoinformations
Samanta, Biswajit Ph.D.(IIT Kharagpur), Geostatistics, Quality Control, Artificial Intelligence

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Faculty Promotion :

Prof. Subir Kumar Mukhopadhyay Professor
RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities:

1. 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.

2. Rock Mechanics / Ground Control – Finite element analysis for longwall strata control problems, and design of shield supports; Extended Finite Element Method (XFEX) for the analysis of rock joints and cracks. 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).

3. 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.

4. 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.

5. Advanced Surveying & Geoinformatics – Integration of GPS & ISAR 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

New Acquisitions:

1. INSTRON - 3500kN. Microprocessor Controlled Universal Testing machine of 3500 kN capacity
2. Orion 5-Star, pH/ORP/ISE/DO/Conductivity Meter
3. Bio-Rad Glass Econo-Column Low Pressure Chromatography Column
4. Oscillating Disc Rheometer MVE Model with computer Control as per ASTM D2084-79 (Temperature Range – 1000–2500°C)
5. Computerized Tensile Testing Machine for Rubber with variable speed, drive and grip separation speed (double coloum type) with cutting press; capacity 500 kg.
7. Rubber Extruder Machine – twin taper screw type with sheet forming die head, internally hard crome plated and water jacketed.
9. Fully automatic steam boiler having steam generation; capacity 250 kg/hr
11. Du-point Cryodon Abrasion Resistance Tester. Model No.: S-1106
12. 3D Terrestrial Laser Scanner from OPTECH

ON-GOING RESEARCH PROJECTS

Sponsored Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Application of High Precision Satellite Imaging and DGPS Technology for online, Wide-area Subsidence Monitoring Study in Raniganj Area, Eastern Coalfields Limited</td>
<td>Coal India Limited</td>
<td>Rs. 240.00 Lakhs</td>
</tr>
<tr>
<td>2.</td>
<td>Investigation on Augmentation of Life of Dump- Truck Tyres through the Improvement of Tyre Retreading Compound and Development of an Optimum Road Maintenance Management System</td>
<td>Coal India Limited</td>
<td>Rs. 148.69 Lakhs</td>
</tr>
<tr>
<td>3.</td>
<td>An Epidemiological Study to assess the role of individual characteristics and working environment on coal miners injuries</td>
<td>MHRD, New Delhi</td>
<td>Rs. 10.00 Lakhs</td>
</tr>
<tr>
<td>4.</td>
<td>Quality Assurance and Supply Chain Management of ROM Limestone</td>
<td>Gujarat Ambuja Cements Limited</td>
<td>Rs. 1.50 Lakhs</td>
</tr>
<tr>
<td>5.</td>
<td>Development of a mixed-culture bio-reactor for mine drainage treatment</td>
<td>Korea Institute of Geosciences and Mineral Resources, South Korea</td>
<td>Rs. 9.00 Lakhs</td>
</tr>
</tbody>
</table>
6. Risk based mine production scheduling using conditional simulation and genetic algorithms for ore grade control
   DST, New Delhi  Rs. 9.10 Lakhs

7. Optimal Selection of Radial Basis function network for ore body modeling using multi objective genetic algorithms
   DST, New Delhi  Rs. 2.88 Lakhs

8. Remote Sensing and GIS based data infrastructure for Base line Environment for New Uranium Mining Site
   BNRS  Rs. 34.00 Lakhs

9. Environmental Hotspot monitoring in Korba Area
   Space Application Centre  Rs. 16.00 Lakhs

10. Development and Implementation of Extended Finite Element Procedures (XFEM) for Cohesive Rock Joints
    DST, New Delhi  Rs. 16.50 Lakhs

11. Technical Study for Stability of Old and Active OB Dumps in WCL for the Dimensional Optimization
    Coal India Limited  Rs. 300.00 Lakhs

12. Integration of GPS and InSAR data for Accurate Ground Profile Determination
    SHELL International and Exploration  Rs. 40.00 Lakhs

13. Re-application of the S&T project “Model Studies on the Efficiency of Gravity Blind Backfilling Method and Evaluation of a Pre-Jamming Indication Parameter” in the field
    Coal S&T, Ministry of Coal  Rs. 395.18 Lakhs

14. Development of Roof Fall Prediction system for underground Mines using wireless network
    Coal India Limited  Rs. 216.98 Lakhs

Consultancy Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Solid Rock Tests of Granite Samples used in Breakwater Construction at Ennore Port</td>
<td>Ennore Port Limited</td>
<td>Rs. 4.85 Lakhs</td>
</tr>
<tr>
<td>2</td>
<td>Rock testing and numerical modeling for stope design at Bangur chromite mine</td>
<td>OMC</td>
<td>Rs. 2.00 Lakhs</td>
</tr>
<tr>
<td>3</td>
<td>Development of image processing technique for Analysis of Rock Joint</td>
<td>KIGAM, Korea</td>
<td>Rs. 10.00 Lakhs</td>
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<tr>
<td>4</td>
<td>Fundamental of GPS Technology along with its application</td>
<td>TISCO, Jamshedpur</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Scientific study of slope stability of Goutam Khari opencast mines, Kothamgudem area</td>
<td>Singreni Collieries Co. Ltd.</td>
<td>Rs. 3.47 Lakhs</td>
</tr>
<tr>
<td>6</td>
<td>Development of a pit optimization software</td>
<td>KIGAM, Korea</td>
<td>Rs. 4.50 Lakhs</td>
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<tr>
<td>7</td>
<td>Stability Analysis of crown pillars at Hutti Gold Mines</td>
<td>Hutti Gold Mines Limited</td>
<td>Rs. 10.97 Lakhs</td>
</tr>
</tbody>
</table>
8. Design and Stability Analysis of Stopes in North, South and North extension Blocks at Bangur chromite Mine, OM
   Orissa Mining Corporation Rs. 3.20 Lakhs
   UCIL Rs. 1.96 Lakhs
10. Study on Backfill Material Composed of Fly Ash / Bottom Ash and Mill Tailings of UCIL
    Tata Power Rs. 4.98 Lakhs
11. Studies on the stability of Underground mine openings and subsidence investigations at Tummallapali project of UCIL
    Uranium Corporation of India Ltd. Rs. 0.50 Lakhs
12. Pressure-quantity Survey and Network Analysis at the GDK-8 & 8A Incline Integrated Circuit, RG-II, SCCL
    Singareni Collieries Co Ltd. Rs. 2.80 Lakhs
13. Resource Evaluation at Srikurmam Beach Sand Project
    Trimex Industries Rs. 0.75 Lakhs
14. Stope Design at Narwapahar Mine
    UCIL Rs. 3.85 Lakhs

VISITS ABROAD BY FACULTY MEMBER

1. Prof. A. Bhattacherjee 32nd International Conference of Safety (Mines Research Institutes Beijing, China)
2. Prof. J. Bhattacharya Visiting Research stipendiary (Helmholtz Association, Germany)
3. Dr. D. Chakravarty Project related work on 3D TLS (OPTECH, Canada)
4. Dr. D. Deb Project related (KIGAM, South Korea)
5. Dr. S. K. Pal To attend 9th Arab International Conference on Polymers Science and Technology (Cairo, Egypt)
6. Prof. K. Pathak For edulink proposal information meeting (University of South Pacific, Suba, Fiji)
7. Prof. K. Pathak PNG Chamber of Mines & Petroleum Conference (Port Mores, Papua New Guinea)

INVITED LECTURES BY FACULTY MEMBERS

1. Prof. A. Bhattacherjee Contribution of Physical Hazards and health related factors in occupational injuries (Beijing, China)
2. Prof. J. Bhattacharya Development of Chemo-bioreactor, for AMD treatment UFT (Magdeburg, Germany)
3. Dr. D. Chakravarty OB Dump vegetation towards into stability (WCL, Nagpur)
4. Dr. D. Deb Subsidence prediction and control (SNU, South Korea)
5. Dr. D. Deb PIT optimization (KIGAM, South Korea)
6. Prof. K. Pathak  
   Subsustainable mining based development strategic needs Asian Pacific Partnership (APP) coal mining task force sustainable development workshop (Kolkata, India)

7. Prof. K. Pathak  
   Facility Planning for surface mining project: A qualitytative decision making approach QDM, 19th National Mining Conference on disaster Management in Mines (IE&ISM, Dhanbad)

LECTURE BY VISITING EXPERT

1. Prof. B. B. Mohanty  
   University of Toronto  
   “Dynamic Fracture Process in Rock and its Application to Mining and Excavation”

2. Mr. Dev Ramachandran  
   RioTinto  
   “The Art of Mine Economics”

3. Dr. Tapan Sarkar  
   University of Queensland, Australia  
   “Corporate Society Responsibilities in Mining”

THESES (Doctoral and MS)

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Snehamoy Chatterjee</td>
<td>Geostatistical Vision based quality control models for Indian mining industry</td>
</tr>
<tr>
<td>2</td>
<td>Sanjay Kumar Palei</td>
<td>Development of Risk Analysis Model for Roof Fall Hazards in underground coal from Eastern South mine India</td>
</tr>
</tbody>
</table>

BOOK PUBLISHED

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the Author(s)</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Prof. J. Bhattacharya</td>
<td>Coal Combustion Quality: Mine Steel and Limestone Plants Operating Guidebook</td>
<td>Wide Publishing</td>
<td>2008</td>
</tr>
<tr>
<td>3</td>
<td>Prof. S. K. Das</td>
<td>Opencast Mining Technology</td>
<td>Sagar Deep Prakashan</td>
<td>2007</td>
</tr>
<tr>
<td>4</td>
<td>Prof. S. K. Das</td>
<td>A Handbook on Surface Mining Technology</td>
<td>Sagar Deep Prakashan</td>
<td>2008</td>
</tr>
</tbody>
</table>
PATENTS GRANTED

1. Dr. D. Deb  
   MAXPIT Software copyright in South Korea

LAURELS & DISTINCTIONS

1. Prof. J. Bhattacharya  
   Fellow of Indian National Academy of Engineering (INAE)
2. Dr. D. Deb  
   Editorial Board Member of JSIR
3. Prof. S. K. Mukhopadhyay  
   Editorial Board Member of Journal of the Mining, Geological and Metallurgical Institute of India
4. Dr. D. Deb and Prof. S. K. Mukhopadhyay (jointly awarded)  
   Institute’s Gold Medal of MGMI, 2007

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

   February, 12-14, 2008
DEPARTMENT OF OCEAN ENGINEERING & NAVAL ARCHITECTURE

HEAD : Professor Nisith Ranjan Mandal

FACULTY

Professor :

Misra, S. C.  Ph.D., Ship Design, Ship Hydrodynamics
Mandal, N. R.  Ph.D., Marine Production, Welding Technology
Satsangi, S. K.  Ph.D., Ocean Structures, Ship Structures, Structural Engineering
Sen, D.  Ph.D., Marine and Ocean Hydrodynamics, Numerical Hydrodynamics
Sha, O. P.  Ph.D., CAD/CAM in Marine Design & Production, Marine Design & Production

Associate Professor :

Sahoo, T.  Ph.D., Coastal Hydrodynamics, Hydroelasticity, Marine and Ocean Hydrodynamics

Assistant Professor :

Bhar, Ashoke  Ph.D., Ocean Engineering Structures
Warrior, Hari V.  Ph.D., Ocean circulation Modeling
Bhaskaran, Prasad  Ph.D., Physical & Dynamical Oceanography, Numerical Modeling of Ocean Waves, Coastal Processes, Tsunamis
Kumar

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities :

1. Wave effects on ships and offshore structures, hydro elasticity of large flexible structures, marine structural analysis using steel and composite materials, marine design and production, structural reliability, ocean circulation, ocean wave modeling, wave attenuation muddy bottoms, settling velocity marine sediments

2. Wave effects on Ships and Offshore Structures, Hydro elasticity of large flexible structures, Marine Structural Analysis using steel and composite materials, Marine Design and Production, Structural reliability

3. Ocean Circulation Modeling, Numerical Modeling of Ocean Waves, Parameterization of Air-Sea Fluxes, Development of Coastal Wave Run-up Model, soft computing tools in ocean parameter retrieval, mechanics of coastal sediment transport
Thrust Areas:

1. CFD
2. Coastal Marine Hazards
3. Marine and Ocean Hydrodynamics
4. Numerical Hydrodynamics
5. Ocean Structures
6. Marine structural analysis
7. Ocean Wave & Circulation Modeling
8. Marine Design
9. Coastal Processes
10. Storm Surge Prediction & Tsunamis

New Acquisitions:

i) 2D – Wave Maker
ii) Milling machine installed in Welding Laboratory

ON-GOING RESEARCH PROJECTS

Sponsored Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3D seakeeping computation for conventional and fast hulls</td>
<td>Naval ResearchBoard (DRDO)</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>A study on the interaction of surface waves with floating and flexible structures</td>
<td>Naval ResearchBoard (DRDO)</td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>An Investigation into Geometric Modelling, Design and Analysis of Complex Surfaces</td>
<td>DRDO</td>
<td>-</td>
</tr>
<tr>
<td>4.</td>
<td>An Investigation into the Hydrodynamic characteristics of Foils with and without Flaps</td>
<td>Naval ResearchBoard (DRDO)</td>
<td>-</td>
</tr>
<tr>
<td>5.</td>
<td>Development of a coastal wave prediction model utilizing Satellite Data</td>
<td>Space ApplicationsCentre (ISRO)</td>
<td>-</td>
</tr>
<tr>
<td>6.</td>
<td>Development of a Comprehensive Atlas on Tsunami Travel time and propagation model for Indian Ocean</td>
<td>IIT Kharagpur</td>
<td>-</td>
</tr>
<tr>
<td>7.</td>
<td>Development of a ship routing code</td>
<td>Space ApplicationsCentre (ISRO)</td>
<td>-</td>
</tr>
<tr>
<td>8.</td>
<td>Development of an Autonomous Underwater Vehicle</td>
<td>Ministry of EarthSciences (MoES)</td>
<td>-</td>
</tr>
<tr>
<td>9.</td>
<td>Modernization of vibration laboratory</td>
<td>MHRD, New Delhi</td>
<td>-</td>
</tr>
<tr>
<td>10.</td>
<td>Ship Design for Efficiency and Economy</td>
<td>Ministry of Shipping</td>
<td>-</td>
</tr>
<tr>
<td>11.</td>
<td>Control of Ballast water problems in ships through design development</td>
<td>Dept. of Shipping</td>
<td>-</td>
</tr>
<tr>
<td>12.</td>
<td>Estimation of Suspended Sediment Concentrations from Ocean Color Monitor onboard OceanSat and algorithm development</td>
<td>Naval ResearchBoard (DRDO)</td>
<td>-</td>
</tr>
</tbody>
</table>
13. Development of single side single pass submerged arc welding
   Sponsor(s): CSIR, New Delhi

14. To develop computer model to predict weld induced residual distortion of large plate panel
   Sponsor(s): DST, New Delhi

15. Development of FRP Roadside Barriers for National Highways
   Sponsor(s): National Highway Authority of India

16. Vulnerability Study of Kalpakkam Coast to Marine Hazards
   Sponsor(s): IGCAR, Kalpakkam

### Consultancy Projects:

<table>
<thead>
<tr>
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<th>Sponsor(s)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Com. of linear and 2nd order force on large stationary of floating structures</td>
<td>Indian Register of Shipping</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>Design and Development of a Technology Demonstrator 10 metres FOILCAT</td>
<td>Naval Science &amp; Technological Laboratory (NSTL), Visakhapatnam</td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>Design and Development of Advanced Propulsors for High speed Hybrid Marine Crafts</td>
<td>NSTL, Visakhapatnam</td>
<td>-</td>
</tr>
<tr>
<td>4.</td>
<td>Design and Development of Highspeed Highbread marine Crafts</td>
<td>NSTL, Visakhapatnam</td>
<td>-</td>
</tr>
<tr>
<td>5.</td>
<td>Design and Development of Advanced Propulsors for High Speed Marine Crafts</td>
<td>NSTL, Visakhapatnam</td>
<td>-</td>
</tr>
<tr>
<td>6.</td>
<td>Development of a generic motion equation for a submerged Body</td>
<td>Macmet India Limited</td>
<td>-</td>
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<tr>
<td>7.</td>
<td>Development of Auto-algorithm for Submerged Body</td>
<td>Macmet India Limited</td>
<td>-</td>
</tr>
<tr>
<td>8.</td>
<td>Development of Ship-in-Campus laboratory</td>
<td>Various Marine Engineering Institute in India</td>
<td>-</td>
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<tr>
<td>9.</td>
<td>Software for trajectory simulation of marine vehicles</td>
<td>NSTL, Visakhapatnam</td>
<td>-</td>
</tr>
<tr>
<td>10.</td>
<td>Hydrodynamic design &amp; design of control surfaces for AUV</td>
<td>NSTL, Visakhapatnam</td>
<td>-</td>
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<tr>
<td>11.</td>
<td>Preparation of design, specifications and drawing for vessels of IWAI</td>
<td>Inland Waterways Authority of India</td>
<td>-</td>
</tr>
<tr>
<td>12.</td>
<td>Development of Software for trajectory simulation of Marine vehicles</td>
<td>NSTL, Visakhapatnam</td>
<td>-</td>
</tr>
<tr>
<td>13.</td>
<td>Development of a comprehensive Ocean atlas for the Indian Ocean utilizing ARGO data</td>
<td>Indian National Centre for Ocean Information Services</td>
<td>-</td>
</tr>
<tr>
<td>14.</td>
<td>Operational marine modeling system for Persian Gulf using WAM model</td>
<td>King Fahd University of Petroleum &amp;</td>
<td>-</td>
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</tbody>
</table>
INVITED LECTURES BY FACULTY MEMBERS

1. Dr. Prasad K. Bhaskaran  
   New Trends in Ocean Wave Modeling Activities (Space Physics Laboratory, Vikram Sarabhai Space Centre (ISRO), Thiruvananthapuram)

LECTURE BY VISITING EXPERT

1. Professor Avijit Gangopadhyay  
   Delivered series of talk during March 2008

THESES (Doctoral and MS)

<table>
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<tbody>
<tr>
<td>1</td>
<td>Ranadev Datta</td>
<td>Development of a B-Spline based method for the 3D forward speed ship motion in Time domain</td>
</tr>
</tbody>
</table>

BOOK PUBLISHED

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>Mr. B. Prasad Kumar, Prof. S. K. Dube, Mr. T. S. Murty, Mr. A. Gangopadhyay, Ayan Chaudhri and Mr. A. D. Rao</td>
<td>The Indian Ocean Tsunami Travel Time Prediction using Neural Networks</td>
<td>Taylor &amp; Francis Group, London, U.K.</td>
<td>2007</td>
</tr>
</tbody>
</table>

PATENTS GRANTED

1. Tsunami Travel Time Prediction using Neural Networks
2. A New approach to derive Ocean parameters using Neural Networks
3. Development of comprehensive ocean atlas for Indian Ocean
DEPARTMENT OF PHYSICS & METEOROLOGY

HEAD: Professor Balbir Kumar Mathur

FACULTY

Professor:

Chandra, Naresh
Ph.D.(Queens University, UK), Atomic, Molecular and Optical Physics

Chandrasekar, A.
Ph.D.(IISc., Bangalore), Atmospheric Sciences

Choudhary, Ram Naresh
Ph.D.(Edinburgh, UK), Ferroelectricity, Crystal Structure,
Liquid Crystals, Condensed Matter Physics (experimental),
Nanomaterials and Nanotechnology

Ghatak, Sobhendu
Kumar
Ph.D.(Calcutta University), Condensed Matter Physics,
Biophysics

Kumar, Krishna
Ph.D.(IIT Kanpur), Hydrodynamic Instabilities and Chaos,
Pattern-formation and Pattern dynamics

Mathur, Balbir Kumar
Ph.D.(IIT Kharagpur), Surface Science, Semiconductors, X-Ray, WEB design, Microprocessor

Raina, Prabhu Krishna
Ph.D.(IIT Kanpur), Nuclear and Particle Physics

Ray, Samit Kumar
Ph.D.(IIT Kharagpur), Semiconductor Physics & Devices,
Thin Film Nanostructures

Samantaray, Biswas
Kumar
Ph.D.(IIT Kharagpur), Experimental Physics, Structure of
Matter, X-Rays

Sharma, Shivcharan Lal
Ph.D.(IIT Kharagpur), Nuclear Physics, Semiconductor Physics,
Radiation Detection and Measurements

Srinivas, Veeturi
Ph.D.(IIT Bombay), Electronic properties of solids, Magnetic,
electrical transport properties, Nano-materials, Non-crystalline solids

Taraphder, Arghya
Ph.D.(IISc., Bangalore), Condensed Matter Physics

Associate Professor:

Bharadwaj, Somnath
Ph.D.(IISc., Bangalore), Astrophysics, Cosmology

Datta, Prasanta Kumar
Ph.D.(Burdwan University), Laser Physics, Nonlinear Optics,
Ultrafast Nonlinear Optical Phenomena, Semiconductor
Optical Amplifier

Kar, Sayan
Ph.D.(IIT Kanpur), Gravitation and Cosmology, Field Theory

Roy, Anushree
Ph.D.(IISc., Bangalore), Nanomaterials, Light scattering and
spectroscopy

Assistant Professor:

Das, Amal Kumar
Ph.D.(IOP, Bhubaneswar), Experimental Condensed Matter
Physics, Thin film growth and characterization, Magnetism
including spintronics

Das, Baidya Nath
Ph.D.(IIT Kharagpur), Condensed Matter Physics
Dhar, Achintya  
Ph.D.(Jadavpur University), Condensed Matter Physics (Experimental)

Khastgir, Sugata Pratik  
Ph.D.(IOP, Bhubaneswar), Mathematical Physics, High Energy Physics

Majumder, Sonjoy  
Ph.D.(IIA, Bangalore), Many-Body Formalism, Atomic And Molecular Physics, Astrophysics, Molecular Electronics, High Performance Computing

Murugesh, Subramaniam  
Ph.D.(University of Madras), Nonlinear Dynamics

Nath, Tapan Kumar  
Ph.D.(IIT Kanpur), Magnetism, Low Temperature Physics, Superconductivity, Semiconductors, Thin Films and Multilayers, Nanostructured Materials

Roy Chaudhuri, Partha  
Ph.D.(IIT Delhi), Fiber / Integrated Optics, Optoelectronics, Experimental Biophotonics

Shukla, Pragya  
Ph.D.(JNU, Delhi), Condensed Matter Physics, Nonlinear Physics

Singh, Ajay Kumar  
Ph.D.(Calcutta University), Experimental Nuclear Physics

Srivastava, Sanjeev Kumar  
Ph.D.(JNU, New Delhi), Materials Engineering using Ion Beams, Thin Films and Multilayers, Nuclear Condensed Matter Physics, Local Magnetism

Thakur, Awalendra Kumar  
Ph.D.(NEHU, Shillong), Solis State Ionic Devices, Ferroelectrics / Dielectrics, Composite Nanostructures, Complex Impedance Spectroscopy Technique

Emeritus Professor:

Prof. H. N. Acharya  
Ph.D.(IIT Kharagpur), Condensed Matter Physics

Scientific Officer:

Chakraborty, Syamal  
Ph.D.(IIT Kharagpur), Glass and ceramics, Sol-gel science, Preparatory course physics, Writing popular science

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Faculty Appointment:

Dr. Sanjoy Majumdar  
Assistant Professor

Dr. S. Murugesh  
Assistant Professor

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities:

The Department is carrying out research and development utilizing in-house facilities and with 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

**Thrust Areas:**

1. Condensed Matter Physics
2. Non-linear Dynamics and complexity
3. Astronomy and Astrophysics
4. Nuclear and Particle Physics

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects:**

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A study of the impacts of initialization of the cyclonic vortex in a high resolution mesoscale tropical cyclone model</td>
<td>DST, New Delhi</td>
<td>Rs. 14.98 Lakhs</td>
</tr>
<tr>
<td>2.</td>
<td>A Theoretical Study on Coherent Structures and Chaos in Nanoscale Ferromagnets</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
</tr>
<tr>
<td>3.</td>
<td>Analysis, Modelling and Design of Semiconductor Optical Amplifier (SOA) based Photonic Components for Lightwave Systems and Networks</td>
<td>Japan-Indo Collaboration Programme: Kyushu University</td>
<td>Rs. 20.00 Lakhs</td>
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<tr>
<td>4.</td>
<td>Angle- and spin-resolved photoelectron spectroscopy of atoms and molecules</td>
<td>DST, New Delhi</td>
<td>Rs. 1.60 Lakhs</td>
</tr>
<tr>
<td>5.</td>
<td>Assimilation of Oceansat –2 scatterometer winds in mesoscale model</td>
<td>Space Application Center, ISRO, Ahmedabad</td>
<td>Rs. 11.00 Lakhs</td>
</tr>
<tr>
<td>6.</td>
<td>Assimilation of satellite data in mesoscale models</td>
<td>Space Application Center, ISRO, Ahmedabad, India</td>
<td>Rs. 18.32 Lakhs</td>
</tr>
<tr>
<td>7.</td>
<td>Augmentation of the experimental infrastructure in condensed matter physics</td>
<td>DST, New Delhi</td>
<td>Rs. 65.00 Lakhs</td>
</tr>
<tr>
<td>8.</td>
<td>Ceramic Titania Foam</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
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<tr>
<td>9.</td>
<td>Cooperative Phenomenon and nanosize effects in some correlated systems</td>
<td>BRNS, DAE, Mumbai</td>
<td>Rs. 17.56 Lakhs</td>
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<td>10.</td>
<td>CRP-Spintronic materials - Simulation</td>
<td>BRNS, DAE</td>
<td>Rs. 107.30 Lakhs</td>
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<td>No.</td>
<td>Project Title</td>
<td>Implementing Agency</td>
<td>Funding Amount</td>
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<td>-------------------------------------------------------------------------------</td>
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<tr>
<td>11</td>
<td>Design and development of plasma spark sintering facility for nano material compaction</td>
<td>MHRD, New Delhi</td>
<td>Rs. 20.00 Lakhs</td>
</tr>
<tr>
<td>12</td>
<td>Development &amp; characterization of nanostructured thin films for SiGe quantum well infrared photodetector and ferroelectric based gas / chemical sensors</td>
<td>DRDO, Govt. of India</td>
<td>Rs. 201.80 Lakhs</td>
</tr>
<tr>
<td>13</td>
<td>Development and Characterization of Nanostructured thin films for SiGe Quantum Well Infrared Photodetector and ferroelectric based gas / chemical</td>
<td>DRDO, Govt. of India</td>
<td>Rs. 201.80 Lakhs</td>
</tr>
<tr>
<td>14</td>
<td>Development of all solid state high repetition rate pico- second laser source tunable in wavelength and in pulse duration for nonlinear optical study</td>
<td>DST, New Delhi</td>
<td>Rs. 55.58 Lakhs</td>
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<tr>
<td>15</td>
<td>Development of Artificially Structured Nano Magnetic Materials for High Frequency Sensor Applications</td>
<td>DRDO, Govt. of India</td>
<td>Rs. 31.00 Lakhs</td>
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<tr>
<td>16</td>
<td>Development of cantilever beam magnetometer for in-situ measurement of mechanical and magnetic properties of thin films for spintronic application</td>
<td>DRDO, Govt. of India</td>
<td>Rs. 68.99 Lakhs</td>
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<tr>
<td>17</td>
<td>Development of efficient UV laser source for laser induced fluorescence study of malignant tissues</td>
<td>MHRD, New Delhi</td>
<td>Rs. 10.00 Lakhs</td>
</tr>
<tr>
<td>18</td>
<td>Development of Ion Conducting Polymer-Nanoceramic Surfaces as Templates</td>
<td>CSIR, New Delhi</td>
<td>Rs. 12.00 Lakhs</td>
</tr>
<tr>
<td>19</td>
<td>Development of microactuators based on shape memory alloy for micro fluidic applications</td>
<td>DRDO, Govt. of India</td>
<td>Rs. 14.71 Lakhs</td>
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<tr>
<td>20</td>
<td>Development of novel magnetic materials for magnetoelectronic applications</td>
<td>BRNS, DAE, Mumbai</td>
<td>Rs. 23.00 Lakhs</td>
</tr>
<tr>
<td>21</td>
<td>Development of optical parametric oscillator tunable in the range of 0.35um to 16.0um for air-borne detection of chemical and biological warfare agent</td>
<td>DRDO, Govt. of India</td>
<td>Rs. 73.29 Lakhs</td>
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<tr>
<td>22</td>
<td>Development of polymer nanocomposite based rechargeable solid-state lithium batteries for ambient and sub-ambient temperature applications</td>
<td>MHRD, New Delhi</td>
<td>Rs. 15.00 Lakhs</td>
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<td>23</td>
<td>Development of Preform for High Power Fiber Laser</td>
<td>BRNS, DAE, Mumbai</td>
<td>Rs. 24.69 Lakhs</td>
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<tr>
<td>24</td>
<td>Development of quantum well infrared photodetectors in wavelength range 8-14 um using Si/SiGe nanotechnology</td>
<td>DIT, New Delhi</td>
<td>Rs. 92.24 Lakhs</td>
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<td>25</td>
<td>Development of terahertz sensors for biomedical imaging and remote detection of chemicals/ biological warfare agents</td>
<td>MHRD, New Delhi</td>
<td>Rs. 10.00 Lakhs</td>
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<td>26</td>
<td>Electronic properties of highly resistive materials</td>
<td>CSIR, New Delhi</td>
<td>Rs. 12.00 Lakhs</td>
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<tr>
<td>No.</td>
<td>Project Description</td>
<td>Funding Agency</td>
<td>Cost (Lakhs)</td>
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<tr>
<td>27.</td>
<td>Al-based quasicrystalline thin films Experimental Investigations on electronic and thermal transport processes in manganite perovskites and development of various sensing devices</td>
<td>CSIR, New Delhi</td>
<td>Rs. 7.78 Lakhs</td>
</tr>
<tr>
<td>28.</td>
<td>Experimental quadratic cascading for their application in photonic devices</td>
<td>DRDO, Govt. of India</td>
<td>Rs. 23.02 Lakhs</td>
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<tr>
<td>29.</td>
<td>Fabrication of cost-effective AC-magnetic susceptibility measurement set up for use with a liquid nitrogen cryostat assembly down to 70 Kelvin</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
</tr>
<tr>
<td>30.</td>
<td>Fabrication of Doped Single-Mode Optical Fibers for Investigation of Bragg Grating Characteristics</td>
<td>DRDO, Govt. of India</td>
<td>Rs. 24.70 Lakhs</td>
</tr>
<tr>
<td>31.</td>
<td>Generation of coherent mid-infrared radiation at 16mm through nonlinear optical difference frequency process for application in molecular spectroscopy</td>
<td>BRNS (DAE, Govt. of India)</td>
<td>Rs. 30.82 Lakhs</td>
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<tr>
<td>32.</td>
<td>Giant magneto-impedance in manganite system</td>
<td>CSIR, New Delhi</td>
<td>-</td>
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<tr>
<td>33.</td>
<td>Investigation of Electrical-transport, Magneto-transport, Extraordinary Hall resistivity, Specific heat and Magnetic studies in nanostructured CMR man</td>
<td>DST, New Delhi</td>
<td>Rs. 128.00 Lakhs</td>
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<tr>
<td>34.</td>
<td>Kinematics of flows in diverse contexts</td>
<td>DST, New Delhi</td>
<td>Rs. 8.52 Lakhs</td>
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<td>35.</td>
<td>Low temperature Raman measurements on novel materials</td>
<td>DST, New Delhi</td>
<td>Rs. 36.00 Lakhs</td>
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<td>36.</td>
<td>Measuring the HI power-spectrum with the GMRT</td>
<td>BRNS, DAE, Govt. of India</td>
<td>Rs. 7.73 Lakhs</td>
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<tr>
<td>37.</td>
<td>On some aspects of Nano-photonics</td>
<td>Italian Ministry of Education</td>
<td>Rs. 12.00 Lakhs</td>
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<tr>
<td>38.</td>
<td>Optical Properties of Fluorescent Nanocrystalline Phosphates and Gallates Co-Doped with transition and rare-earth element</td>
<td>CSIR, New Delhi</td>
<td>Rs. 7.16 Lakhs</td>
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<tr>
<td>39.</td>
<td>Positron Double-Beta-Decay Processes and Study of Some Fundamental Problems in Neutrino Physics</td>
<td>DST, Govt. of India and Italian Ministry of Foreign Affairs</td>
<td>Rs. 5.00 Lakhs</td>
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<tr>
<td>40.</td>
<td>Preparation &amp; Evaluation of Polymer Nanocomposite Films for Low Temperature Battery Applications</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
</tr>
<tr>
<td>41.</td>
<td>Preparation &amp; Evaluation of Thermally Stable Ceramic Materials for Solid Oxide Fuel Cell Applications</td>
<td>MHRD, New Delhi</td>
<td>Rs. 12.00 Lakhs</td>
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<tr>
<td>42.</td>
<td>R&amp;D in Photonic Crystal Fibers: Design, Fabrication and Experimental Characterization for Applications in Optical Communications and Sensors</td>
<td>DST, Govt. of India</td>
<td>Rs. 35.28 Lakhs</td>
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<tr>
<td>43.</td>
<td>Realization of packet switched node with optoelectronic and photonic technologies</td>
<td>Ministry of Education, Italy</td>
<td>-</td>
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<tr>
<td>Project Number</td>
<td>Project Title</td>
<td>Funding Agency</td>
<td>Amount</td>
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<td>----------------</td>
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<tr>
<td>44.</td>
<td>Second order cascaded nonlinear optical processes for all-optical photonic devices</td>
<td>DST, Govt. of India</td>
<td>Rs. 7.62 Lakhs</td>
</tr>
<tr>
<td>45.</td>
<td>Spectroscopy of nuclei close to beta-stability line by using complete- and incomplete-fusion and deep-inelastic reactions</td>
<td>DST, New Delhi</td>
<td>Rs. 13.00 Lakhs</td>
</tr>
<tr>
<td>46.</td>
<td>Studies in Photon-Atom and Photon-Molecule Interactions</td>
<td>DST, New Delhi</td>
<td>Rs. 5.50 Lakhs</td>
</tr>
<tr>
<td>47.</td>
<td>Studies in Quantum Information and Spectroscopy Involving Photons, Electrons, Atoms, and Molecules</td>
<td>CSIR, New Delhi</td>
<td>Rs. 5.50 Lakhs</td>
</tr>
<tr>
<td>48.</td>
<td>Studies of Atoms and Molecules in the Presence of External Fields</td>
<td>CSIR, New Delhi</td>
<td>Rs. 8.00 Lakhs</td>
</tr>
<tr>
<td>49.</td>
<td>Studies of Transport Properties and Localisation of Waves in Random Media</td>
<td>DST, New Delhi</td>
<td>Rs. 14.00 Lakhs</td>
</tr>
<tr>
<td>50.</td>
<td>Studies on Laser-Optical Fiber-Based Micro-Imaging Techniques in the Analysis of Tissue Structure and Detection of Abnormalities</td>
<td>IIT Kharagpur</td>
<td>Rs. 5.00 Lakhs</td>
</tr>
<tr>
<td>51.</td>
<td>Studies on the impact of satellite data assimilation in mesoscale models’</td>
<td>CSIR, New Delhi</td>
<td>Rs. 10.00 Lakhs</td>
</tr>
<tr>
<td>52.</td>
<td>Study of Giant magneto-impedance(GMI) in soft ferromagnet for sensor application</td>
<td>CSIR, New Delhi</td>
<td>Rs. 11.75 Lakhs</td>
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<tr>
<td>53.</td>
<td>Study of magnetic properties of thin films on semiconductor substrates using cantilever beam magnetometer</td>
<td>CSIR, New Delhi and IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
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<tr>
<td>54.</td>
<td>Study of single particle and collective degrees of freedom in nuclei at high spin through heavy-ion fusion evaporation reaction mechanism</td>
<td>IIT Kharagpur</td>
<td>Rs. 2.52 Lakhs</td>
</tr>
<tr>
<td>55.</td>
<td>Technology Development and Research with Photonic Crystal Fibers and Components for Advanced Photonic Sensor System</td>
<td>DRDO, Govt. of India</td>
<td>Rs. 62.84 Lakhs</td>
</tr>
<tr>
<td>56.</td>
<td>To study the effect of interfaces for efficient transport of carriers in organic light emitting materials</td>
<td>CSIR, New Delhi</td>
<td>Rs. 9.91 Lakhs</td>
</tr>
<tr>
<td>57.</td>
<td>Transport properties in organic light emitting materials and role of interfaces for efficient conduction</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
</tr>
<tr>
<td>58.</td>
<td>Upgrading Raman spectrometer to microRaman spectrometer to study biomaterials</td>
<td>DRDO, New Delhi</td>
<td>Rs. 49.80 Lakhs</td>
</tr>
<tr>
<td>59.</td>
<td>Z-scan determination of third order optical nonlinearity</td>
<td>IIT Kharagpur</td>
<td>Rs. 2.00 Lakhs</td>
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</tbody>
</table>

**Consultancy Projects:**
<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Development of Admission Modules for IISER</td>
<td>IISER Mohali</td>
<td>Rs. 3.00 Lakhs</td>
</tr>
<tr>
<td>2.</td>
<td>High resolution X-ray diffraction</td>
<td>Various agencies</td>
<td>Rs. 2.00 Lakhs</td>
</tr>
<tr>
<td>3.</td>
<td>UV Opacity Evaluation in the samples of cold and anti sun burn cream</td>
<td>DARL, DRDO, Govt. of India</td>
<td>Rs. 0.50 Lakhs</td>
</tr>
</tbody>
</table>

VISITS ABROAD BY FACULTY MEMBER

1. Dr. Pragya Shukla  
   Scientific Collaboration with Prof. A. Leggett (Noble Prize Winner, year 2003) (University of Illinois at Urbana-Champaign, Illinois, USA)  
   Four Months; during August 01 – November 30, 2007

2. Prof. Samit Kumar Ray  
   Collaborative research (University of Newcastle, UK)

3. Dr. Tapan Kumar Nath  
   To present a research paper in Magnetism and Magnetic Materials (Tampa, Florida, USA)  
   7 days; during November 04–11, 2007

4. Dr. Amal Kumar Das  
   Scientific collaboration (Linz University, Austria)  
   Two months

5. Dr. Awalendra Kumar Thakur  
   To chair Technical Session at “16th International Materials Research Congress (IMRC)” (Cancun, Mexico)

6. Dr. Awalendra Kumar Thakur  
   To attend International Conference on “Materials for Advanced Technologies (ICMAT-2007)” (The National University of Singapore, Singapore)

INVITED LECTURES BY FACULTY MEMBERS

1. Prof. A. Chandrasekar  
   Weather Prediction Through Modeling (Jadavpur University, Kolkata)

2. Prof. A. Chandrasekar  
   Principles of weather prediction through modeling (Institute of Minerals and Materials Technology, Bhubaneshwar)

3. Prof. A. Chandrasekar  
   Chaos in the atmosphere (Institute of Minerals and Materials Technology, Bhubaneshwar)

4. Prof. A. Chandrasekar  
   Atmospheric Chaos (Jadavpur University, Kolkata)

5. Prof. A. Chandrasekar  
   3-D var data assimilation of MODIS temperature and humidity profiles for improved simulation of mon depress (Ministry of Earth Sciences, New Delhi)

6. Prof. Samit Kumar Ray  
   Electrical and Optical Characteristics of Ge Nanocrystals Embedded in Oxide Matrices (IISc, Bangalore)

7. Prof. Samit Kumar Ray  
   Silicon Germanium Nanostructures for
<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Research Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Prof. Samit Kumar Ray</td>
<td>Silicon-Germanium Nanostructures for Optoelectronic Devices (BHU, Varanasi)</td>
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<tr>
<td>9</td>
<td>Prof. Samit Kumar Ray</td>
<td>High resolution X-ray diffraction (ITC Sonar Bangla, Kolkata)</td>
</tr>
<tr>
<td>10</td>
<td>Prof. Samit Kumar Ray</td>
<td>Semiconductor Nanostructures: Growth and Properties (University of Newcastle, UK)</td>
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<tr>
<td>11</td>
<td>Prof. Samit Kumar Ray</td>
<td>Growth and Device Application of Silicon-Germanium Nanostructures (Sree Chitra Tirunal Institute for Medical Sciences &amp; Technology, Trivandrum)</td>
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<td>12</td>
<td>Prof. Samit Kumar Ray</td>
<td>Growth of Silicon-Germanium Nanostructures for Optoelectronic Devices (IIT Kharagpur)</td>
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<tr>
<td>13</td>
<td>Dr. Tapan Kumar Nath</td>
<td>Nanostructured CMR oxides (Mysore University, Karnataka)</td>
</tr>
<tr>
<td>14</td>
<td>Dr. Tapan Kumar Nath</td>
<td>Investigation of electrical-transport, Magnetotransport, etc. studies in nano CMR manganites (Nuclear Science Center, New Delhi)</td>
</tr>
<tr>
<td>15</td>
<td>Dr. Partha Roy Chaudhuri</td>
<td>Photonic Crystal Fibers: analysing index-guiding realistic structures – a general designing and modeling (IIT Guwahati)</td>
</tr>
<tr>
<td>16</td>
<td>Dr. Partha Roy Chaudhuri</td>
<td>Fused Fiber Coupler Components for Optical Communication: Physics and Technology (IIT Guwahati)</td>
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<tr>
<td>17</td>
<td>Dr. Partha Roy Chaudhuri</td>
<td>Optical Fiber Sensors and Devices: Physics and Technology (Benaras Hindu University)</td>
</tr>
<tr>
<td>18</td>
<td>Dr. Partha Roy Chaudhuri</td>
<td>All-fiber Devices with Fused Fiber Coupler and Hollow Optical Fiber for Optical Communication (????????????????)</td>
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<tr>
<td>19</td>
<td>Dr. Sayan Kar</td>
<td>Unusual bound states in quantum mechanics (IUCAA, Pune)</td>
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<tr>
<td>20</td>
<td>Prof. Ram Naresh Prasad Choudhary</td>
<td>Multiferroics: Design, development and application (ISM University, Dhanbad, India)</td>
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<td>21</td>
<td>Prof. Ram Naresh Prasad Choudhary</td>
<td>Nanoferroelectrics: Synthesis and Characterization (BS College, Danapur, Bihar)</td>
</tr>
<tr>
<td>22</td>
<td>Dr. Somnath Bharadwaj</td>
<td>Cosmology (PXE (DRDO) Chandipur)</td>
</tr>
<tr>
<td>23</td>
<td>Dr. Sanjeev Kumar Srivastava</td>
<td>Exploring quantum criticality via local magnetism (Inter University Accelerator Centre, New Delhi)</td>
</tr>
<tr>
<td>24</td>
<td>Dr. Achintya Dhar</td>
<td>MEMS to Nanotechnology (IIT Kharagpur)</td>
</tr>
<tr>
<td>25</td>
<td>Dr. Achintya Dhar</td>
<td>Organic Optoelectronics – a future promise (IIT Kharagpur)</td>
</tr>
<tr>
<td>26</td>
<td>Dr. Awalendra Kumar Thakur</td>
<td>Impedance Spectroscopy: A Tool for Electrical Analysis of Nanostructured Semiconducting (Cancun, Mexico)</td>
</tr>
<tr>
<td>27</td>
<td>Dr. Awalendra Kumar Thakur</td>
<td>Solid Oxide Fuel Cells: Problems and Prospects (GVM College, Sonepat, India)</td>
</tr>
</tbody>
</table>
28. Dr. Awalendra Kumar Thakur Microstructure – Electrical Property Correlation in Nanostructured Ferroic Ceramics (IIT Kharagpur)

**LECTURE BY VISITING EXPERT**

1. Dr. T. Souradeep IUCAA, Pune
   - Cosmology with the cosmic microwave background
2. Prof. Sougato Bose University College, London
   - Quantum indistinguishability and quantum information
3. Dr. S. Bandyopadhyay Max Planck Institute for Complex System, Dresden, Germany
   - Renormalisation of dephasing by zero-point fluctuations
4. Prof. R. Banerjee SN Bose Centre, Kolkata
   - Introduction to Hawking Radiation and Anomalies
5. Professor Govind Swarup GMRT, Pune
   - Detecting neutrinos with GMRT
6. Prof. S.K. Dash IIT Delhi
   - Climate Change - The Indian Perspective

**THESES (Doctoral and MS)**

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>G. Anil Kumar</td>
<td>Some Studies on Important Aspects of Charged particle Spectroscopy with Ionization Detectors and Some Aspects of Alpha Induced Fusion Reactions with 27 / 13 Al</td>
</tr>
<tr>
<td>2</td>
<td>Tarun Kumar Jha</td>
<td>Relativistic Nuclear Equation of State and ITS Application to Neutron Star in the Mean field approach</td>
</tr>
<tr>
<td>3</td>
<td>Piyush Ranjan Das</td>
<td>Investigation of structural, Dielectric and Electrical Properties of some Tungsten Bronze Ferroelectric Vanadates</td>
</tr>
<tr>
<td>4</td>
<td>Xavier V. F.</td>
<td>The effect of Assimilation of satellite and conventional meteorological data on the prediction of tropical meteorological systems over Indian using a mesoscale model</td>
</tr>
<tr>
<td>5</td>
<td>Aparna Roy</td>
<td>Structure and Magnetic properties of Ni Nanoparticles prepared by borohydride reduction method</td>
</tr>
</tbody>
</table>

**BOOK PUBLISHED**

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the Author(s)</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Prof. R. N. P. Chaudhary</td>
<td>Dielectrics &amp;</td>
<td>Anamaya</td>
<td>2008</td>
</tr>
</tbody>
</table>
and Dr. A. K. Thakur (Editors)

Ferroelectrics: Modern Perspectives

Publishers Pvt. Ltd., New Delhi


Experiments With G-M Counter (Pages 59)

Company Publication 2008

LAURELS & DISTINCTIONS

1. Dr. Pragya Shukla

"TGAP" award for visiting scientists by American Physical Society (2007)

2. Prof. Samit Kumar Ray

MRSI Medal Lecture Award (2008)

3. Prof. Samit Kumar Ray

Fellow - Indian National Academy of Engineering (2008)

4. Dr. Awalendra Kumar Thakur

Received Invitation for Editorial Board Membership in the International Journal - "The Open Energy and Fuels", Bentham Science Publishers (2008)

5. Dr. Syamal Chakraborty

Sahitya Akademi prize for Literary Translation (2007)

6. Dr. Sayan Kar

Distinguished Lecturer Programme - S N. Bose National Centre for Basic Sciences (2008)

7. Dr. Sanjeev Kumar Srivastava


ADDITIONAL INFORMATION

Major Design Works

1. Design of a quantum well based far infrared detector in 8-14 micron wavelength range
CENTRE FOR EDUCATIONAL TECHNOLOGY

CHAIRMAN : Professor Tapan Kumar Basu

FACULTY

Professor :

Basu, T. K. Ph.D., Speech Processing; Image processing

Assistant Professor :

Bhattacharya, Bani Ph.D., Instructional Design, Evaluation
Mohanty, Atasi Ph.D., Educational Psychology, Counselling

Visiting Faculty :


Officer :

Vasisth, Jyothi Ph.D., Teaching Evaluation

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities :

CET, IIT Kharagpur is offering an M.Tech Programme on “Media and Sound Engineering”. The second batch of students have already joined the programme.

CET has also initiated Ph.D programmes in both, areas related to educational pedagogy and in engineering. Research scholars are already working in these areas. Two research scholars have joined in the area of Educational Technology and two, in the area of Speech processing have joined the department.

Thrust Areas :

The Center has produced nearly 4200 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 3500 users access these courses on any single day within the LAN of IIT
Kharagpur.

New Acquisitions:

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. 50.0 lakhs.

ON-GOING RESEARCH PROJECTS

Sponsored Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Resource Material Development using Educational Technology</td>
<td>IIT Kharagpur</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>National Mission Challenges Project</td>
<td>MHRD, New Delhi</td>
<td>Rs. 1,500.00 Lakhs</td>
</tr>
<tr>
<td>3</td>
<td>Pedagogical Research for the best way of learning for different groups</td>
<td>IIT Kharagpur</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Standardization and Quality Assurance of E-learning Content</td>
<td>IIT Kharagpur</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Learning Resource Design &amp; Development (LRDD) project</td>
<td>IIT Kharagpur</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>LCMS &amp; Virtual Group Learning Tool</td>
<td>IIT Kharagpur</td>
<td>-</td>
</tr>
</tbody>
</table>

Consultancy Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>National Programme on Technology Enhanced Learning (NPTEL)</td>
<td>MHRD, New Delhi</td>
<td>Rs. 36.00 Lakhs</td>
</tr>
</tbody>
</table>

INVITED LECTURES BY FACULTY MEMBERS

1. Dr. B. Bhattacharya
   PAN-IIT Forum I for Action Planning at Mysore, India - Infosys Global Education Center, June 3-5, 2007
2. Dr. B. Bhattacharya
   “Educational Pedagogy” – TEQUIP programme, BIT, Mesra, Ranchi
3. Prof. T. K. Basu
   “Inclusive Education” - Jadavpur University
4. Prof. T. K. Basu
   “New Assessment methods in student evaluation”, NSCB College, Calcutta

LECTURE BY VISITING EXPERT

1. Prof. K. Srivathsan, Director, IIITM, IIIT, Kerala
   “Digital Grid and Education”
2. Prof. K. Dutta, Jadavpur University
   “Multimedia uses in Elearning”
3. Prof. S. Bhattacharya, Jadavpur University “Quality Assurance in Elearning”
4. Prof. Yagnanarayana, IIIT, Hyderabad “Speech Processing in Educational Technology”

BOOK PUBLISHED

<table>
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<tr>
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<th>Name of the Author(s)</th>
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</tr>
</thead>
</table>

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

1. MHRD / AICTE sponsored workshop – “Summer School in Educational Technology”
2. MHRD / AICTE sponsored workshop – “Introduction to Digital Speech Processing”
HEAD: Professor Subir Kumar Satsangi

FACULTY

Assistant Professor:

Chakraborty, A. Ph.D. (IIT Delhi), Atmospheric and Ocean Modeling
Dash, M. K. Ph.D. (Gujarat University), Remote Sensing
Mandal, M. Ph.D. (IIT Delhi), Mesoscale Atmospheric Modeling, Tropical Cyclone and Data Assimilation
Satyanarayana, A. N. V. Ph.D. (BHU), Atmospheric Boundary Layer Observations and Modeling
Shaji, C. Ph.D. (IIT Delhi), Ocean Modeling and Coastal Processes

Professor (Joint Faculty):

Chandrasekar, A. Ph.D. (IISc., Bangalore), Atmospheric Physics

Associate Professor (Joint Faculty):

Sen, D. J. Ph.D. (IIT Delhi), Water Resource Engineering

Assistant Professor (Joint Faculty):

Bhaskaran, P. K. Ph.D. (Kurukshetra), Ocean Wave Modeling
Warrior, H. V. Ph.D. (South Florida), Ocean Circulation

Emeritus / Distinguished Professor:

Gangopadhyay, A. Ph.D. (University of Rhode Island), Coastal operational ocean modeling, basin-scale circulation modeling, feature based modeling of Bay of Bengal
Pandey, P. C. Ph.D. (Allahabad), Space Based Ocean, Atmosphere and Polar Research
Robinson, A. R. Dynamics of rotating and stratified fluids, Dynamics & modeling of Ocean currents and biological dynamics in the ocean

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Faculty Appointment:

Dr. C. Shaji Assistant Professor
RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities:

The centre is involved in frontier areas of research in Earth System Science observation and modeling. CORAL is actively participating in utilizing the satellite (Megha-Tropiques and OceanSat-II) to study the flux dynamics over the tropical ocean; data assimilation in numerical models for ocean state prediction; delineating the sea ice pixels; retrieval of wind vector including implementing advance modeling system to simulate the ocean circulation and the features over Bay of Bengal. Efforts are on in developing an operational model for ocean state forecasting of Bay of Bengal.

CORAL is playing key role in the multi-institutional coordinated national programme “Severe Thunderstorm – Observations and Regional Modeling (STORM)” supported by Department of Science and Technology, Government of India, to study various observational and modeling aspects for enhancing our understanding and prediction of severe thunderstorms associated with Nor’wester (Kaal-baishaki). In this connection, a 50 meter micro-meteorological tower with various atmospheric measurement sensors is established, as a national facility, in the Agriculture Farm of the institute to obtain special observations during pre-monsoon thunderstorms. In addition, the centre is also involved in mesoscale modeling of extreme weather events viz., tropical cyclone, heavy rainfall, severe thunderstorms, micro-physical processes and mesoscale data assimilation.

Thrust Areas:

1. Thunderstorms: Observations and Modeling
2. Climate Change
3. Ocean Observations and Modeling

ON-GOING RESEARCH PROJECTS

Sponsored Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Study of Boundary Layer Characteristics at Kharagpur during occurrence of severe thunderstorms</td>
<td>DST, New Delhi</td>
<td>Rs. 47.00 Lakhs</td>
</tr>
<tr>
<td>2.</td>
<td>Monitoring thermo-dynamical structure of atmospheric boundary layer during pre-monsoon convective activity over Kharagpur</td>
<td>DST, New Delhi</td>
<td>Rs. 157.00 Lakhs</td>
</tr>
<tr>
<td>3.</td>
<td>Study of variability in the air-sea interaction over the tropical Indian Ocean using the observations from Megha – Tropiques</td>
<td>SAC (ISRO)</td>
<td>Rs. 12.24 Lakhs</td>
</tr>
<tr>
<td>4.</td>
<td>Monitoring of sea ice using Oceansat-II scatterometer data for determination of</td>
<td>SAC (ISRO)</td>
<td>Rs. 22.80 Lakhs</td>
</tr>
</tbody>
</table>
climate trend
5. Development of Operational Physical Ocean Model for Bay-of-Bengal INCOIS Rs. 54.00 Lakhs
6. Simulation of Bay-of-Bengal Circulation features using OCEANSAT-II Scatterometer Wind and OCM SAC (ISRO) Rs. 17.40 Lakhs

VISITS ABROAD BY FACULTY MEMBER
1. Dr. A. N. V. Satyanarayana Participated in the ‘International Training School on Atmospheric Brown Clouds (ABC) at organized by UNEP at Asian Institute of Technology, Thailand (Bangkok and Maldives), (December 4-8 and 10-14, 2007 respectively)

INVITED LECTURES BY FACULTY MEMBERS
1. Dr. A. Chakraborty The 2004 Indian Ocean Tsunami and Plate motions on (Raja N. L. Khan Women's College, Midnapore) (April 17, 2007)
2. Prof. P. C. Pandey Satellite for Weather and Climate Research (Kurukshetra University (November 22, 2007)

LECTURE BY VISITING EXPERT
1. Prof. Avijit Gangopadhyay, University of Massachusetts, Dartmouth, USA Operational Ocean Modeling for the Western North Atlantic in support of building an Integrated Ocean Observation System
2. Prof. Avijit Gangopadhyay, University of Massachusetts, Dartmouth, USA Research topics and opportunities in the Global Ocean : From Physics to Fish finding and making some money

PATENTS GRANTED

LAURELS & DISTINCTIONS
1. Prof. P. C. Pandey Obtained Khosla National Award, Gold Medal and Citation, by IIT Roorkee, November 15, 2007, for his lifetime
2. Prof. P. C. Pandey
Achievement in Engineering
Awarded Prof. K. R. Ramanathan Memorial Gold Medal and Citation by Indian Geophysical Union, November 22, 2007
CRYOGENIC ENGINEERING CENTRE

HEAD : Professor Vutukuru Vasudeva Rao

FACULTY

Professor :

Kalvey, V. R. M.Sc., Ph.D. (Georgetown, USA), Superconductivity and Low Temperature Physics
Sarangi, S. K. M.S., Ph.D. (SUNY, Stony Brook), Cryogenic Processes and Equipment
Bandyopadhyay, S. S. M.Tech., Ph.D. (IIT Kharagpur), Natural Gas and Hydrogen energy, Carbon dioxide capture and sequestration, air breathing propulsion
Dey, T. K. M.Sc., Ph.D. (Delhi University), Experimental Condensed matter Physics, Cryo-instrumentation
Rao, V. V. M.Sc., Ph.D. (IIT Madras), Vacuum Technology, Applied Superconductivity, Cryo-Physics

Assistant Professor :

Sandilya, P. M.Tech., Ph.D. (IIT Kanpur), Hydrogen and Carbon dioxide storage, Nonconventional Energy, Process Intensification
Nandi, T. K. Ph.D. (IIT Kharagpur), Low Temperature Refrigeration, Turbomachinery, Thermal Engineering
Ghosh, Indranil M.Tech., Ph.D. (IIT Kharagpur), Heat Exchanger, Sorption Cooling
Ghosh, Parthasarathi M.Tech., Ph.D. (IIT Kharagpur), Cryogenic Process Simulation, Cryogenic Expander and Equipment
Venimadhav, Adyam M.Sc., Ph.D. (IISc., Bangalore), Functional Materials, Epitaxial thin films, Magnetic Oxides

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities :

1. Design of super conducting magnets from electrical and fusion applications
2. Thermophysical investigations on Nanofluids and Nanocomposites
3. Development of Functional Materials for thermoelectric and spintronic applications
4. Computational works on heat exchanger & heat transfer
5. Natural gas processing
6. Studies on vortex tube in flight air separator for air breathing propulsion
7. Carbon dioxide capture and sequestration
8. Gas hydrates for energy generation and environmental protection
9. Design of Vacuum systems for food processing applications
10. Refurbishing of DC/RF systems
11. Characterization of Cryogenic regenerator
12. Studies on Gas bearing for cryogenic expander
13. Sorption cooler
14. Design of systems for safe handling of Oxygen
15. Simulation of helium liquefier

**Thrust Areas :**

1. Multiferroics, Spintronics, Environment friendly thermoelectrics
2. Natural Gas Processing and non conventional energy
3. Carbon Dioxide Capture & Sequestration
4. Air Breathing Propulsion
5. Cryogenic Refrigeration
6. Novel magnetic materials
7. Nanofluids and Nanocomposites
8. Superconducting magnets – Design issues and applications
9. Vacuum Technology
10. Oxygen safety
11. Simulation of cryogenic plants

**New Acquisitions :**

1. Freeze Drying equipment
2. Ferroelectric test system for multiferroic characterization

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects :**

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
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<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Investigation on the giant magneto-impedance (GMI) of bulk and thin films of Lanthanum Manganites and development of magnetic position Sensors</td>
<td>CSIR, New Delhi</td>
<td>Rs. 15.00 Lakhs</td>
</tr>
<tr>
<td>2</td>
<td>Natural Gas Processing: Removal of CO₂ from Sour Gas Streams</td>
<td>MHRD, New Delhi</td>
<td>Rs. 12.00 Lakhs</td>
</tr>
<tr>
<td>3</td>
<td>Analysis &amp; development of conceptual design methodologies for air collection and enrichment system of air breathing propulsion</td>
<td>ISRO</td>
<td>Rs. 15.00 Lakhs</td>
</tr>
<tr>
<td>4</td>
<td>Safe design of oxygen systems</td>
<td>ISRO – STC</td>
<td>Rs. 18.40 Lakhs</td>
</tr>
<tr>
<td>5</td>
<td>Development of infrastructural facilities at Cryogenic Engg. Centre (FIST)</td>
<td>DST, New Delhi</td>
<td>Rs. 100.00 Lakhs</td>
</tr>
<tr>
<td>6</td>
<td>Studies on gas bearing for cryogenic turboexpander</td>
<td>IIT Kharagpur</td>
<td>Rs. 4.30 Lakhs</td>
</tr>
</tbody>
</table>
7. Development of a test rig for characterization of cryogenic regenerators
   IIT Kharagpur Rs. 3.00 Lakh

8. Refurbishing a DC/RF sputtering and development of ferromagnetic / Semiconductor hybrid structures for spintronics
   IIT Kharagpur Rs. 4.60 Lakh

9. Studies on desorption cooling from activated carbon
   IIT Kharagpur Rs. 3.00 Lakh

10. Development of thermophysical measurement system for liquids and investigations on the thermal conductivity and pool boiling characteristics of various nanofluids
    DST, New Delhi Rs. 29.00 Lakh

11. Development of an experimental test facility for process intensification of an integrated fuel system for marine energy generation and storage
    NMRL (DRDO) Rs. 194.447 Lakh

Consultancy Projects:

<table>
<thead>
<tr>
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<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>R &amp; D Study on Aluminium coating of composite Airframe of PJ-10</td>
<td>DRDL</td>
<td>Rs. 3.5 Lakh</td>
</tr>
<tr>
<td>2.</td>
<td>Wetting of the Design of Vacuum Drying System</td>
<td>Mariental India Pvt. Ltd., New Delhi</td>
<td>Rs. 1.00 Lakh</td>
</tr>
<tr>
<td>3.</td>
<td>Development of software and detailed calculation for Explosive Decompression Chamber</td>
<td>KASCO Industries, Pune</td>
<td>Rs. 0.50 Lakh</td>
</tr>
</tbody>
</table>

VISITS ABROAD BY FACULTY MEMBER

1. Prof. Kanchan Chowdhury
   Visit to Queensland University of Technology, Brisbane, Australia to do research on Oxygen Safety

2. Dr. Venimadhav Adyam
   Visit to Pennsylvania State University (2 months) towards research collaboration

INVITED LECTURES BY FACULTY MEMBERS

1. Prof. Tapas Kumar Dey
   Thermo-physical properties of Nanofluids – the next generation coolants (NCTP-07, Kolam) – Invited Talk

2. Prof. Kanchan Chowdhury & Mr. Parthasarathi Ghosh
   Major Issues involved in Helium and Nitrogen Cryogenics for National Fusion Technology Programme (PSSI-IPR Workshop on National Fusion Programme – ITER & IPR –
3. Prof. S. S. Bandyopadhyay

4. Dr. Venimadhav Adyam
   Miss fit layered cobaltate oxides for high temperature thermoelectric applications (Pennsylvania State University, USA)

5. Venimadhav Adyam
   AICTE sponsored Winter School (IIT Kharagpur)

LECTURE BY VISITING EXPERT

1. Dr. Biswanath Sarkar, Institute for Plasma Research, Gandhinagar
   “Involvement of Cryogenics in Nuclear Fusion Technology & ITER Project”

THESES (Doctoral and MS)

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Soma Das</td>
<td>Electrical Transport and Magneto-calories Properties in Potassium doped Lanthanum Manganites</td>
</tr>
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</table>

BOOK PUBLISHED

<table>
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<tbody>
<tr>
<td>1</td>
<td>Prof. S. S. Bandyopadhyay, Mr. A. K. Biswas, Mr. D. Bhattacharyya, Mr. A. K. Ray, Ed.</td>
<td>Advances in Separation Processes</td>
<td>Allied Publishers, New Delhi</td>
<td>2007</td>
</tr>
</tbody>
</table>

LAURELS & DISTINCTIONS

1. Prof. S. S. Bandyopadhyay
   Acted as a panelist in the International panel discussion on ‘Approach towards an international joint venture for safe, affordable, high speed air and space transportation’ during the International Conference on high Speed Transatmospheric Air and Space Transportation, Hyderabad, June 29-30, 2007

2. Prof. S. S. Bandyopadhyay
   Editor: Indian Chemical Engineer (ICE), Published by the Indian Institute of Chemical
3. Prof. Kanchan Chowdhury

Awarded the fellowship “Endeavor India Executive Award” for 4 months (June 2007-September 2007) to do research on Oxygen Safety at Queensland University of Technology, Brisbane, Australia.

4. Prof. Kanchan Chowdhury


5. Dr. P. Sandilya

V A Altekar Award, November 2007, from National Metallurgical Laboratory, Jamshedpur (CSIR).

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED


MATERIALS SCIENCE CENTRE

HEAD: Professor Chapal Kumar Das

FACULTY

Professor:

Adhikari, Basudam (Ph.D., Polymer materials science and technology)
Banthia, Ajit Kumar (Ph.D., Polymeric Materials)
Bhattacharya, Debasis (Ph.D., Synthesis and processing of thin film and bulk ceramics, Nanoceramics and Nano composites, Ceramics for thermal barrier applications, Ceramics for biomedical applications)
Das, Chapal Kumar (Ph.D., Blends and nanocomposites of elastomers and plastics, gas phase polymerization)
Ram, Shanker (Ph.D., Nanoceramics, Condensed matter physics, Applied thermodynamics of materials, Magnetic materials & applications)

Associate Professor:

Banerjee, Sushanta (Ph.D., Polymer synthesis and Characterization, Membranes for separation of gas mixtures, High temperature low-K polymers)
Banerji, Pallab (Ph.D., Electronic Materials and Devices)
Jacob, Chacko (Ph.D., Wide bandgap semiconductors)

Assistant Professor:

Basu Majumder, Subhasish (Ph.D., Electroceramics and Ceramic composites)
Khatua, B. B. (Ph.D., Polymer blends, Nanocomposites, Conducting polymer composites)

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Faculty Appointment:

Dr. B. B. Khatua (Assistant Professor)

Faculty Promotion:

Dr. Sushanta Banerjee (Associate Professor)
Dr. Pallab Banerji (Associate Professor)
Dr. Chacko Jacob (Associate Professor)
RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities:

1. Development of novel chemical methods and their applications in synthesizing nanomaterials and composites of magnetic, optical, and electronic applications;
2. Polymer and Ceramic Gas Sensors;
3. Lithium ion rechargeable batteries, multiferroics, ceramic composites Nanofluids;
4. Wide bandgap Materials, SiC thin films for high temperature electronics;
5. Oxide semiconductors;
6. LPE growth of semiconductors;
7. MOCVD growth of III-V semiconductors and quantum dots, Semiconductor crystal growth;
8. High performance polymeric composites and advanced polymer blends and alloys;
9. LCP-polyolefin blends and nanocomposites with nanoclay as well as carbon nanotubes;
10. High performance polymer synthesis and characterization;
11. Polymer membranes for gas separation;
12. Direct Fluorination of polymers;
13. Polymeric Nano composites;
14. Development of jute based fully biodegradable green composites, jute-cement composites, geotextiles, sound proofing panels, rubber coated jute etc.;

Thrust Areas:

1. Organic and inorganic semiconducting materials
2. Polymers and ceramic matrix nanocomposites
3. Biomaterials.

New Acquisitions:

1. SEM
2. XRD – EDAX
3. GPC
4. High temperature GPC
5. Gas permeation apparatus
6. Contact angle measuring instrument
7. Capillary rheometer
8. CHNSO analyzer
9. Tapecasting unit
10. Thermal conductivity measuring instrument

ON-GOING RESEARCH PROJECTS

Sponsored Projects:
<table>
<thead>
<tr>
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<th>Title of the Project</th>
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<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Development of Novel Polyphosphazene based High Performance Polymeric Composites For Wide Temperature Range Application</td>
<td>DRDO, New Delhi</td>
<td>Rs. 48.08 Lakhs</td>
</tr>
<tr>
<td>2</td>
<td>Development of High Performance Advanced Polymer Blends and Alloys for Aerospace Applications</td>
<td>DMSRDE, Kanpur</td>
<td>Rs. 9.00 Lakhs</td>
</tr>
<tr>
<td>3</td>
<td>Investigation on Augmentation of Life of Dump-Truck through the Improvement of Tyre Retreading Compound and development of an Optimum Road Maintenance Management System</td>
<td>Coal India Limited, Kolkata</td>
<td>Rs. 148.69 Lakhs</td>
</tr>
<tr>
<td>4</td>
<td>Development of Cr$^{3+}$/Cr$^{4+}$co-doped stabilized c-ZrO$_2$ nanoparticles as a new series of high temperature solid electrolytes and their other applications</td>
<td>CSIR, New Delhi</td>
<td>Rs. 2.32 Lakhs</td>
</tr>
<tr>
<td>5</td>
<td>“Phase stability and intergranular giant-magnetoresistance properties in (La$<em>{1-x}$Eu$<em>x$)$</em>{0.67}$Ca$</em>{0.33}$MnO$_3$ in a hybrid nanocomposite structure”</td>
<td>UGC, CSR, Indore</td>
<td>Rs. 0.90 Lakhs</td>
</tr>
<tr>
<td>6</td>
<td>High coercivity magnetic AFe12019 (A:Ba and/or Sr) nanofibrils of controlled shape anisotropy for radar and other high frequency application</td>
<td>CSIR, New Delhi</td>
<td>Rs. 15.00 Lakhs</td>
</tr>
<tr>
<td>7</td>
<td>New chemical methods in synthesis of noble-metal nano-powders &amp; porous metalloceramic composites for hydrogen energy storage, combustion and other applications</td>
<td>Department of Atomic Energy, Mumbai</td>
<td>Rs. 20.00 Lakhs</td>
</tr>
<tr>
<td>8</td>
<td>Synthesis and characterization of processable novel co(polyetherimide)s as low dielectric constant material for microelectronic packaging</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
</tr>
<tr>
<td>9</td>
<td>Preparation of novel polymeric materials for chemical sensor application: Synthesis and tailoring of properties in molecular level</td>
<td>DRDE / DRDO, Gwalior</td>
<td>Rs. 7.54 Lakhs</td>
</tr>
<tr>
<td>10</td>
<td>Molecularly engineered novel membrane precursors and preparation of novel polymer nano-composite membranes for selective separation of gas mixture</td>
<td>DST, New Delhi</td>
<td>Rs. 50.95 Lakhs</td>
</tr>
<tr>
<td>11</td>
<td>Synthesis and characterization of novel light emitting poly(arylene)s and poly(arylene ether)s and derivative thereof</td>
<td>CSIR, New Delhi</td>
<td>Rs. 9.06 Lakhs</td>
</tr>
<tr>
<td>12</td>
<td>Equipment donation grant received from Alexander von Humboldt Foundation, Germany</td>
<td>Humboldt Foundation, Germany</td>
<td>Rs. 9.02 Lakhs</td>
</tr>
<tr>
<td>13</td>
<td>Wet chemical synthesis of novel cathode materials for lithium ion rechargeable batteries</td>
<td>CSIR, New Delhi</td>
<td>Rs. 10.46 Lakhs</td>
</tr>
</tbody>
</table>
14. Novel Nano-structured Ceramics for Gas Sensing Applications  
   DIT, New Delhi  
   Rs. 30.77 Lakhs

15. Infrastructure Development for the Wet Chemical Synthesis of Advanced Ceramics  
   IIT Kharagpur  
   Rs. 3.00 Lakhs

   IIT Kharagpur  
   Rs. 3.40 Lakhs

17. Development of SiC thin films for high temperature and high power devices  
   DRDO, New Delhi  
   Rs. 49.76 Lakhs

18. Development of polymer based biomimetic sensors  
   DST, New Delhi  
   Rs. 10.00 Lakhs

19. Development of Suitable Production System for Natural Rubber Coated Jute Fabrics for Novel End Uses  
   JMDC, Kolkata  
   Rs. 3.00 Lakhs

    JMDC, Kolkata  
   Rs. 66.00 Lakhs

21. Development of durable water-repellent jute geotextiles with natural ecofriendly additive for application in erosion control in river banks and other appropriate end uses composites  
    JMDC, Kolkata  
   Rs. 180.00 Lakhs

22. Development of Jute Fiber Reinforced Cement Concrete Composites composites  
    JMDC, Kolkata  
   Rs. 75.60 Lakhs

23. Development of jute based sound proofing composites  
    JMDC, Kolkata  
   Rs. 32.00 Lakhs

24. MOCVD growth of InGaP / GaAs epilayers and quantum dot for solar cell  
    DST, New Delhi  
   Rs. 49.00 Lakhs

25. MOCVD growth of GaAs for photovoltaic application  
    IIT Kharagpur  
   Rs. 3.00 Lakhs

Consultancy Projects :

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Development of composites</td>
<td>KE Technical Textiles Pvt. Ltd., Kharagpur</td>
<td>Rs. 0.40 Lakhs</td>
</tr>
</tbody>
</table>

VISITS ABROAD BY FACULTY MEMBER

1. Prof. Chapal K. Das  
   To participate in Conference (Beijing, China) May 2007

2. Prof. Chapal K. Das  
   To participate in Conference (Cairo, Egypt) November 2007

3. Prof. S. Ram  
   Research (University of Ulm, Ulm Germany) May-July 2007

4. Dr. Sushanta Banerjee  
   Follow-up sponsorship program from Humboldt Foundation (IPF-Dresden, Germany) May 14 – July 13, 2007
5. Dr. Subhasish Basu Majumder Research under Alexander von Humboldt Fellowship (RWTH, IWE-II, Aachen, Germany) May 08 – August 10
6. Dr. Subhasish Basu Majumder Visiting Faculty; University of Puerto Rico (June 09 – July 04)
7. Dr. Chacko Jacob To attend a conference (Germany) Diamond 2007

INVITED LECTURES BY FACULTY MEMBERS

1. Prof. S. Ram Optical properties in ceramic composites; Indian Institute of Technology Kanpur (December 13-15, 2007)
2. Dr. Subhasish Basu Majumdar International Workshop on Mesoscopic Nanoscopic and Microscopic Materials (IWMNMM-2008); Bhubaneswar
3. Dr. Subhasish Basu Majumdar National Conference on Recent Advances in Innovative Materials (RAIM-08), NIT
4. Dr. Pallab Banerji Discussion Meeting on “Role of Surface & Interfaces in Nanomaterials”, Saha Institute of Nuclear Physics, Kolkata
5. Dr. Pallab Banerji DST Expert Advisory Committee Meeting on “Molecular electronics, conducting polymer electronics & Non-invasive and other bio-sensors”, BARC, Mumbai
6. Dr. Pallab Banerji Chairing a Session in Workshop on Physics & Technology of All-optical Communication, Components & Devices”, IIT Kharagpur

LECTURE BY VISITING EXPERT

1. Dr. Arup Bhattacharya Carbon nanotubes based polymer composites
2. Mr. R. O. Dusane New process technology to develop silicon thin films for MEMS & opto-electronic applications
3. Dr. Pranaba Kishor Muduli Ferromagnetic & semiconductor hybrid structure for spintronics application
4. Mr. S. K. Mishra Direct observation of the dual behavior of the Mn uncompensated AF Spins in exchanged biased IrMn / NiFe bilayers
5. Dr. Amit Das Polymer Nanocomposite
6. Dr. R. Bhattacharya CMOS compatible nano phtonics & related materials issues

THESES (Doctoral and MS)

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
</tr>
</thead>
</table>
1. Swatilekha Das  
   Pervaporation separation of organic compound-water mixtures by polymer membranes

2. Suparna Sarkar  
   Lactic acid and polyethylene glycol based biodegradable polyurethanes

3. Aparna Gupta  
   Studied on CVD growth and characterization of 3C-SiC thin films, nanopowders and other nanostructures

4. Somnath Biswas  
   Development of Novel Series of GMR materials of half-metallic ferromagnetic CrO$_2$ nanoceramics

5. Kunal Pal  
   Design development and evaluation of hydrogels for biomedical applications

6. Partha Pratim Sengupta  
   Polyamline : Synthesis, characterization and ammonia sensing behavior

7. Samik Pal  
   Growth and characterization of HFCVD grown tungsten oxide thin films and nanostructures

8. Hiranmayee Satapathy  
   Synthesis, characterization and properties of modified methacrylate / acrylamide monomers and polymers containing pendant phenyl group
RELIABILITY ENGINEERING CENTRE

HEAD : Professor Ravindra Babu Misra

FACULTY

Professor :

Misra, R. B. Ph.D., Reliability and Safety of Electronic, Electrical & Software Systems

Associate Professor :

Naikan, V. N. A. Ph.D., Reliability Engineering, Machinery Fault Diagnosis

Assistant Professor :

Chaturvedi, S. K. Ph.D., Network Reliability Analysis & Prediction, Reliability Testing and Data Analysis

Senior Lecturer :

Goyal, Neeraj Ph.D., Network Reliability, Probabilistic Risk Assessment, Software Reliability

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities :

The Centre is not only active in its regular academic activities but also regularly undertaking consultancy projects of national importance, organizing conference on reliability and safety engineering and short term courses on latest topics of Reliability Engineering for officers and engineers of the Industry, Defense Organizations and R&D Establishments. The following are the areas in which the current R&D activities are on :

1. Reliability Analysis of One-Shot Devices
2. Software Reliability and Soft-Computing Tools
3. Reliability and Maintenance Engineering
4. Probabilistic Safety Analysis of Atomic Power Plants

Thrust Areas :

Applications and Implementations of Reliability Theory such as Reliability Analysis and Predictions, Software Reliability, Design for Reliability, System Safety and Risk Highly Accelerated Life Testing on some Real Systems

New Acquisitions :
Environment Testing Chambers, viz., Burn-in and Thermal Shock Chambers from ESPEC, Japan under DST-FIST Program are installed

ON-GOING RESEARCH PROJECTS

Sponsored Projects :

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Duration</th>
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</thead>
</table>

Consultancy Projects :

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Reliability Work Package for Garuda (A Missile Aft Section) Missile System</td>
<td>DRDL, Hyderabad</td>
<td>Rs. 8.00 Lakhs</td>
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<tr>
<td>2.</td>
<td>RAMS for ASTRA Missile System</td>
<td>DRDL, Hyderabad</td>
<td>Rs. 11.00 Lakhs</td>
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<tr>
<td>3.</td>
<td>Shutdown PSA of Kakrapara Atomic Power Station</td>
<td>NPCIL, Mumbai</td>
<td>Rs. 10.22 Lakhs</td>
</tr>
<tr>
<td>4.</td>
<td>Reliability Prediction of Data Link Systems</td>
<td>DEAL, Dehradun</td>
<td>Rs. 8.63 Lakhs</td>
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<tr>
<td>5.</td>
<td>Reliability Improvement of Metering Products</td>
<td>Secure Meters Ltd., Udaipur</td>
<td>Rs. 12.00 Lakhs</td>
</tr>
</tbody>
</table>

INVITED LECTURES BY FACULTY MEMBERS

1. Prof. R. B. Misra
   Delhi University
2. Prof. R. B. Misra
   IGCAR, Kalpakkam
3. Dr. V. N. A. Naikan
   IGCAR, Kalpakkam

LAURELS & DISTINCTIONS

1. Prof. R. B. Misra
   Senior Member, IEEE
2. Dr. S. K. Chaturvedi
   Member IEEE
3. Dr. S. K. Chaturvedi
   Assistant Editor to International Journal of Performability Engineering

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

1. Early Software Reliability Prediction                                April 18-20, 2007
HEAD : Professor Tapan Kumar Chaki

FACULTY

Professor :

Bhowmick, Anil Kumar  Ph.D.(IIT Kharagpur), Rubber Technology, Thermoplastic Elastomers and TPVs, Composites, Polymer Blends and Alloys, Nanocomposites, Electron Beam Processing, Adhesion, Polymer Modification

Chaki, Tapan Kumar  Ph.D.(IIT Kharagpur), Rubber Technology, Polymer Nanocomposites, Electron Beam Processing of Polymers, Conductive Rubber Composites, Adhesives for Space Application

Khastgir, Dipak  Ph.D.(IIT Kharagpur), Rubber Technology, Polymer Characterization, Polymer Composites, Conductive Polymer and Composites, Rubber Product Development Technology, Piezo Composites and Piezo Rubber

Nando, Golok Behari  Ph.D.(IIT Kharagpur), Polymer Blends and Alloys, Rubber Composites including nano composites, Polymer Modifications and Synthesis, Polymer Recycling, Thermoplastic Elastomers, Latex Technology

Tripathy, Deba Kumar  Ph.D.(IIT Kharagpur), Production Engineering, Rubber Technology, Metal Forming, Rubber Engineering

Assistant Professor :

Bandyopadhyay, Abhijit  Ph.D.(IIT Kharagpur), Nanocomposites, Polymer Blends and Composites, Radiation Processing of Polymers, Waste Management

Chakraborty, Kalyan Kumar  Ph.D.(Calcutta University), Polymer Science and Technology

Chattopadhyay, Santanu  Ph.D.(IIT Kharagpur), Specialty nano-composites, Modification of polymers and blends, Radiation processing of polymers, Combinatorial polymer research, Living polymerization and branched polymer, Conducting polymeric films and dewetting

Naskar, Kinsuk  Ph.D.(University Twente), Polymer blends and composites, Thermoplastic elastomers and TPVs, Rubber compounding and vulcanization

Singha, Nikhil Kumar  Ph.D. (IIT Bombay), Polymer and Rubber Chemistry, New Methods of Polymerization, Polymer Modification, Characterization of Polymers

RESEARCH AND DEVELOPMENT
Brief descriptions 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 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. Microcellular rubber composite for various industrial application
10. Development of rubber blends and composites for different industrial application like cable, oil seal, tank track pad, vibration isolators
11. Adhesion
12. Biodegradable polymers
13. Controlled radical polymerization
14. Polymers for biomedical applications

Thrust Areas:

1. Nanocomposites
2. Polymer composites for electronic applications
3. Controlled polymerization for synthesis of new tailor-made and bio-active polymers
4. Rubber in medical and health care applications
5. Recycling of waste polymers and rubbers
6. Electron beam treatment and processing of polymer composites

New Acquisitions:

1. HAAKE Polylab OS
2. RPA 2000
3. High performance fatigue resistance rubber compound
4. Piezo composites

ON-GOING RESEARCH PROJECTS

Sponsored Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>An approach for recycling of polymeric</td>
<td>IIT Kharagpur</td>
<td>Rs. 1.00 Lakhs</td>
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<tr>
<td></td>
<td>wastes</td>
<td></td>
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<tr>
<td>2.</td>
<td>Controlled Radical Polymerization using</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
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<td>No.</td>
<td>Description</td>
<td>Network/Agency</td>
<td>Amount (Lakhs)</td>
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<td>------</td>
<td>------------------------------------------------------------------------------</td>
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<tr>
<td>3.</td>
<td>Development of Castor oil based nanocomposite for Biomedical Application</td>
<td>CSIR, New Delhi</td>
<td>Rs. 7.00</td>
</tr>
<tr>
<td>4.</td>
<td>Development and properties of polymer based nanocomposites</td>
<td>DST, New Delhi</td>
<td>Rs. 34.00</td>
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<tr>
<td>5.</td>
<td>Development of Advanced Electromagnetic Interference Shielding Materials from Carbon Nanotube filled Polymer Composites</td>
<td>IIT Kharagpur</td>
<td>Rs. 0.50</td>
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<tr>
<td>6.</td>
<td>Development of Electron Beam Irradiated Composites based on Multi-Walled Carbon Nanotubes in Polymer Matrices</td>
<td>DAE, Mumbai</td>
<td>Rs. 14.60</td>
</tr>
<tr>
<td>7.</td>
<td>Development of Jute based coated Textile using Waste Plastics</td>
<td>AICTE, New Delhi</td>
<td>Rs. 15.05</td>
</tr>
<tr>
<td>8.</td>
<td>Development of Modified Bituminous Binder</td>
<td>DST, Govt. of West Bengal</td>
<td>Rs. 4.00</td>
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<tr>
<td>9.</td>
<td>Development of novel applications using electron beam irradiation : (i) improved extrudability of raw and waste polymers, (ii) adhesion improvement</td>
<td>DAE, Mumbai</td>
<td>Rs. 17.67</td>
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<tr>
<td>10.</td>
<td>Development of polymer based nanocomposites</td>
<td>MHRD, New Delhi</td>
<td>Rs. 15.00</td>
</tr>
<tr>
<td>11.</td>
<td>Development of special purpose heat resistant cable insulating compounds based on polyolefins and polydimethylsiloxane rubber blends using EB</td>
<td>DAE, BARC, Mumbai</td>
<td>Rs. 13.11</td>
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<tr>
<td>12.</td>
<td>Dynamically vulcanized blends (TPVs) based on polyolefin elastomer (POE) via peroxide crosslinking (BPE)</td>
<td>CSIR, New Delhi</td>
<td>Rs. 9.56</td>
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<td>14.</td>
<td>Fundamental Studies on Improvement of ageing and degradation resistance of the hydrogenated Nitrile Rubber</td>
<td>Lanxess, Germany</td>
<td>Rs. 35.00</td>
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<tr>
<td>15.</td>
<td>Fundamental Studies on Structure and Properties of Nanocomposite Rubbers for Tire Applications</td>
<td>Goodyear Tire and Rubber Company, Akron, Ohio, USA</td>
<td>Rs. 24.00</td>
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<tr>
<td>16.</td>
<td>Nanotechnology and radiation processing of organic-inorganic hybrid materials based on thermoplastic elastomer</td>
<td>DST, New Delhi</td>
<td>Rs. 9.00</td>
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<tr>
<td>17.</td>
<td>Novel Microporous Polymeric Membranes for Medical Applications</td>
<td>DBT, New Delhi</td>
<td>Rs. 14.15</td>
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<tr>
<td>18.</td>
<td>Novel rubber based nanocomposites using nanofibers and nanographites : Development, structure and properties</td>
<td>DRDO</td>
<td>Rs. 20.80</td>
</tr>
<tr>
<td>19.</td>
<td>Novel thermoplastic elastomers based on Epoxidized Natural Rubber and PP by dynamic crosslinking</td>
<td>DST, New Delhi</td>
<td>Rs. 10.32</td>
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<tr>
<td>20.</td>
<td>Novel thermoplastic elastomers based on silicone rubber by dynamic vulcanization</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00</td>
</tr>
<tr>
<td>21.</td>
<td>Polyurethane Foam for Radioactive Material Transportation Packages</td>
<td>DAE, Mumbai</td>
<td>Rs. 29.00</td>
</tr>
</tbody>
</table>
22. Preparation of Equivalent standards for Rubber mix and Products DRDL, Hyderabad Rs. 4.00 Lakhs
23. Segmented polyurethane (SPU) based nano composites from functionalized nanoclays with special reference to fire and flammability ISRO, Bangalore Rs. 6.00 Lakhs
24. Study on modification and properties of thiol terminated liquid polymers by chemical reaction with nanostructured functional materials ISRO, Thiruvanathapuram Rs. 18.00 Lakhs
25. Tack and cured adhesion of brominated isobutylene para methyl styrene with other rubbers Exxon Mobil, Baytown, Texas, USA Rs. 24.00 Lakhs
26. Transition Metal Catalyzed Radical Polymerization of the Specialty Monomers DST, New Delhi Rs. 13.00 Lakhs

Consultancy Projects :

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Advise on development of value added natural rubber and polymer blends</td>
<td>Packwell, New Delhi</td>
<td>Rs. 0.50 Lakhs</td>
</tr>
<tr>
<td>2</td>
<td>Ageing, failure analysis and life estimation of rubber seals for military aircraft</td>
<td>ApolloTyre</td>
<td>Rs. 9.00 Lakhs</td>
</tr>
<tr>
<td>3</td>
<td>Development of Conductive Compounds</td>
<td>NAC Group of Industries, Aurangabad</td>
<td>Rs. 0.56 Lakhs</td>
</tr>
<tr>
<td>4</td>
<td>Development of Dough Moulding Compound</td>
<td>Phoenix Yule, Kalyani</td>
<td>Rs. 2.00 Lakhs</td>
</tr>
<tr>
<td>5</td>
<td>Development of Elastomeric Bearings</td>
<td>HAL, Bangalore, India</td>
<td>Rs. 2.25 Lakhs</td>
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<tr>
<td>6</td>
<td>Development of Fire Resistant Conveyor Belt Compound as per AS-S Grade</td>
<td>Phoenix Yule, Kalyani</td>
<td>Rs. 3.20 Lakhs</td>
</tr>
<tr>
<td>7</td>
<td>Development of fire resistant energy optimized belt</td>
<td>Phoenix Yule</td>
<td>Rs. 2.00 Lakhs</td>
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<tr>
<td>8</td>
<td>Development of Flame resistant Cable compound</td>
<td>Servel Udyog Ltd., New Delhi</td>
<td>Rs. 2.50 Lakhs</td>
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<tr>
<td>9</td>
<td>Development of Heat and Flame resistant conveyor belts as per AS-S specifications</td>
<td>PYL, Kalyani, West Bengal</td>
<td>Rs. 3.57 Lakhs</td>
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<td>10</td>
<td>Development of polymer blends, Phase-1</td>
<td>Sethia Finance &amp; Trading Co., New Delhi</td>
<td>Rs. 2.00 Lakhs</td>
</tr>
<tr>
<td>11</td>
<td>Development of rubber and polymer clad rolls at cold rolling mill complex of Tata Steel</td>
<td>Tata Steel</td>
<td>Rs. 20.08 Lakhs</td>
</tr>
<tr>
<td>12</td>
<td>Development of rubber clad rolls used in the PLTCM and the ECL sections of the cold rolling mill complex</td>
<td>Tata Steel, Jamshedpur</td>
<td>Rs. 7.30 Lakhs</td>
</tr>
<tr>
<td>13</td>
<td>Development of rubber compound for sheathing of cables</td>
<td>Servel Udyog Pvt. Ltd., Delhi</td>
<td>Rs. 2.50 Lakhs</td>
</tr>
<tr>
<td>14</td>
<td>Development of Steel Cord Conveyor Belt Cover Compound With High Tensile</td>
<td>Phoenix Yule Ltd., Kalyani</td>
<td>Rs. 2.77 Lakhs</td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
<td>Organization</td>
<td>Cost (Rs. Lakhs)</td>
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</tr>
<tr>
<td>15.</td>
<td>Development of test procedure for specific heat for different fibres through DSC and Study of variation of specific heat with temperature</td>
<td>Apollo Tyre, Limda, Vadodara</td>
<td>0.10</td>
</tr>
<tr>
<td>16.</td>
<td>Development of test procedure for specific heat for different rubber compounds through DSC and Study of variation of specific heat with temperature</td>
<td>Apollo Tyre, Limda, Vadodara</td>
<td>0.30</td>
</tr>
<tr>
<td>17.</td>
<td>Development of value added natural rubber</td>
<td>Packwell, New Delhi</td>
<td>0.60</td>
</tr>
<tr>
<td>18.</td>
<td>Elimination of Pit Mark on Platen during Vulcanisation of FR Conveyor Belt</td>
<td>Phoenix Yule</td>
<td>2.69</td>
</tr>
<tr>
<td>19.</td>
<td>Identification of rubber as prime materials</td>
<td>Customs, New Delhi</td>
<td>0.75</td>
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<tr>
<td>20.</td>
<td>Removal of grain mark from belt surface</td>
<td>Phoenix Yule</td>
<td>1.82</td>
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<tr>
<td>21.</td>
<td>Rubber compound analysis</td>
<td>Fenner</td>
<td>0.15</td>
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<tr>
<td>22.</td>
<td>Studies of the technical requirements of elastomeric inflatable seals</td>
<td>IGCAR, Kalpakkam</td>
<td>22.00</td>
</tr>
<tr>
<td>23.</td>
<td>Studies on the technical requirements of elastomeric inflatable seals</td>
<td>IGCAR, Kalpakkam</td>
<td>18.00</td>
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<tr>
<td>24.</td>
<td>Thermoplastic Elastomer Development</td>
<td>GE, Bangalore</td>
<td>1.50</td>
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<tr>
<td>25.</td>
<td>Utilization of waste rubber</td>
<td>Packwell Ind., New Delhi</td>
<td>1.60</td>
</tr>
</tbody>
</table>

**VISITS ABROAD BY FACULTY MEMBER**

1. Prof. Deba Kumar Tripathy  
   Paper presentation (China) 12 days
2. Prof. Deba Kumar Tripathy  
   Chief Guest, (Nepal Engineering College, Nepal) 7 days
3. Prof. Golok Behari Nando  
   Key Note Speaker and Chairing a Technical Session, in PPS-2007, Asia-Australia Meeting (Shanghai, China) July 11-16, 2007
4. Prof. Golok Behari Nando  
   Guest Speaker and Chairing one day session in Thai Rubber Conference-2007 (Bangkok, Thailand) July 5-6, 2007
5. Prof. Golok Behari Nando  
   Visit M/S Revertex Ltd. in Malaysia on invitation (Kluang, Malaysia) July 17-18, 2007
6. Dr. Nikhil Kumar Singh  
   Invited lecture (Durham University)
7. Dr. Nikhil Kumar Singh  
   Invited seminar (Department of Biosciences, Kent University)
8. Prof. Anil Kumar Bhowmick  
   To deliver an invited talk (China) May 10-13, 2007
9. Prof. Anil Kumar Bhowmick  
   To deliver an invited talk (Thailand) June 24-29, 2007
10. Prof. Tapan Kumar Chaki  
    To attend Swiss Bonding-07 (Zurich, Switzerland) May 9-18, 2007
INVITED LECTURES BY FACULTY MEMBERS

1. Prof. Dipak Khastgir  
   Polymer in Cable Applications by Khastgir, Dipak (High Voltage Laboratory, Department of Electrical Engineering, Indian Institute of Science, Bangalore)

2. Prof. Dipak Khastgir  
   Science and Technology of Metal-Rubber Bonding (Indian Rubber Institute, Mysore & SJCE College of Engineering, Mysore)

3. Prof. Deba Kumar Tripathy  
   Relaxation behaviour of Chlorobutyl vulcanizates – Effect of fillers (Beijing University)

4. Prof. Deba Kumar Tripathy  
   Effect of Carbon black on relaxation behaviour of Chlorobutyl rubber (Indian Rubber Expo 2007)

5. Prof. Deba Kumar Tripathy  
   Dieletric relaxation characteristics of microcellular EPDM rubber vulcanizates (International Polymer Forum, Hozhou, China)

6. Dr. Nikhil Kumar Singha  
   Controlled Ring Opening Polymerization of a Vinyl Cyclopropane (National Chemical Laboratory, Pune)

7. Dr. Nikhil Kumar Singha  
   Microencapsulation of a specific drug via Supension polymerization (Department of Chemistry & Polymeric Biomaterials, University of Sheffield, UK)

8. Dr. Nikhil Kumar Singha  
   A Thermally Amendable Polymethacrylate by Atom Transfer Radical Polymerization (Durham University)

9. Dr. Nikhil Kumar Singha  
   Polymers as Drug Delivery Vehicle (Department of Biosciences, Kent University)

10. Prof. Anil Kumar Bhowmick  
    Rubber Nanocomposites (Qingdao, China)

11. Prof. Anil Kumar Bhowmick  
    Rubber Nanocomposites (Bangkok, Thailand)

12. Prof. Anil Kumar Bhowmick  
    Rubber Education and Research in the World (Cochin, India)

13. Prof. Anil Kumar Bhowmick  
    Nanocomposites (Goodyear Tire and Rubber Company)

14. Prof. Anil Kumar Bhowmick  
    Thermoplastic Elastomers (GLS Corporation)

BOOK PUBLISHED

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the Author(s)</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Prof. Anil K. Bhowmick</td>
<td>Current Topics of Elastomer Research</td>
<td>Taylor and Francis, USA</td>
<td>2007</td>
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<tr>
<td>2</td>
<td>Dr. Abhijit Bandyopadhyay and Prof. A. K. Bhowmick</td>
<td>Rubber-Silica hybrid Nanocomposites in Recent Researches on</td>
<td>Mercel Decker, USA</td>
<td>2008</td>
</tr>
</tbody>
</table>
3. Mr. A. Ganguly, Mr. J. J. Georje, Mr. S. Kar, Dr. A. Bandyopadhyya and Prof. A. K. Bhowmick
Rubbers (Reference) Rubber Nanocomposites based on Miscellaneous nanofillers in Recent Researches on Rubbers (Reference) Mercel Decker, USA 2008

4. Prof. D. K. Tripathy
Finite Element analysis in Elastomer in Polymer Processing Technology (Text) Asian Book Pvt. Ltd. 2008

5. Dr. S. Dey Sadhu, Mr. M. Maiti and Prof. A. K. Bhowmick
Elastomer-Clay Nanocomposites in Current Topics in Elastomer Research (Reference) Taylor and Francis, USA 2008

6. Mr. Anandhan Srinivasan, Dr. A. M. Shanmugharaj and Prof. Anil K. Bhowmick
Waste Rubber Recycling in Current Topics in Elastomer Research (Reference) Taylor and Francis, USA 2008

7. Mr. R. Sengupta, Mr. I. Banik, Dr. P. Sen Majumder, Dr. V. Vijayabaskar and Prof. A. K. Bhowmick
Electron Beam Processing of Rubber in Current Topics in Elastomer Research (Reference) Taylor and Francis, USA 2008

8. Mr. S. Mitra, Dr. K. Naskar and Prof. A. K. Bhowmick
Dynamic Mechanical Analysis of Polymers in Thermal Analysis (Reference) RAPRA, UK 2008

**PATENTS GRANTED**

1. Prof. G. B. Nando and Mr. T. Vikram
   Novel multifunctional additive grafted Rubber and process for the preparation thereof

2. Prof. Anil K. Bhowmick; Mr. Amit Biswas; Mr. Raja Krishnamurthy; Ms. Nisha Preschilla and Mr. Samik Gupta
   Thermoplastic Elastomer Composition, Method of Making and Articles Thereof

3. Prof. Anil K. Bhowmick and Mr. Debojyoti Banerjee
   Improved rubber-covered conveyor belt consuming reduced energy for driving the same

4. Mr. Sandip Kumar Bhattacharya; Mr. Indranil Chakraborty; Prof. Anil K. Bhowmick and Mr. Biswanath Dutta
   A rubber formulation for rubber covering rolls used in steel industry

**LAURELS & DISTINCTIONS**

1. Prof. T. K. Chaki
   Vice President, Indo-Swiss Bonding (2007)
SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

1. A Half-day Seminar on “Safety in Laboratory”
2. International Short Term Course on "Recent Advances in Polymeric & Rubbery Materials (RAPRM)"
HEAD : Professor Pratap Bhanu Singh Bhadoria

FACULTY

Associate Professor :
Lahiri, Debabrata Ph.D., Agricultural Economics & Appropriate Technology
Mahapatra, Subhash Ph.D., Agronomy & Transfer of Technology
Chandra
Bhowmick, Pradip MA, Ph.D., D.Litt., Rural & Tribal Development
Kumar

Assistant Professor :
Behera, Mukunda Deb Ph.D., Ecology, Environment & Geoinformation

Lecturer :
Das, Bela Ph.D., Cartography, Human ecology & Environment

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Faculty Appointment :
Dr. Mukunda Behera Assistant Professor
Dr. Bela Das Lecturer (Senior Scale)

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities :
Earth Observation System Applications for Forest Studies Vis-a-Vis Rural Interface

Thrust Areas :
Transfer of Technology

New Acquisitions :
Spatial Modelling Laboratory

ON-GOING RESEARCH PROJECTS
### Sponsored Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
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<tr>
<td>1</td>
<td>Rural Technology Action Group (RuTAG)—Eastern India</td>
<td>PSA to the GOI, New Delhi</td>
<td>Rs. 29.00 Lakhs</td>
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<td>2</td>
<td>Biodiversity Characterization in Part of UP State</td>
<td>Department of Space, Hyderabad</td>
<td>Rs. 20.00 Lakhs</td>
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<td>3</td>
<td>Biodiversity Characterization in Part of UP State</td>
<td>Department of Space, Hyderabad</td>
<td>Rs. 5.00 Lakhs</td>
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<td>4</td>
<td>Carbon Pool Assessment in Part of Orissa &amp; West Bengal State</td>
<td>Department of Space, Dehradun</td>
<td>Rs. 5.00 Lakhs</td>
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<td>5</td>
<td>Demonstration of Technology for Green House Production of Roses and Extraction of Rose Oil</td>
<td>DST, New Delhi</td>
<td>Rs. 1.70 Lakhs</td>
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### BOOK PUBLISHED

<table>
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<tr>
<th>#</th>
<th>Name of the Author(s)</th>
<th>Title</th>
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<tbody>
<tr>
<td>1</td>
<td>Mr. A. K. Halder and Dr. P. K. Bhowmik</td>
<td>Societies &amp; Culture in India (Vol. III)</td>
<td>R.N. Bhattacharjee, Kolkata, 2008</td>
</tr>
</tbody>
</table>

### COPYRIGHTS GRANTED

1. Prof. P. B. S. Bhadoria, Mr. M. Basu and Dr. S. C. Mahapatra Soil Liming Software 1.0 (SLS 1.0)
2. Prof. P. B. S. Bhadoria, Mr. M. Basu and Dr. S. C. Mahapatra Economic Analysis Software 1.0 (EAS 1.0)
3. Prof. P. B. S. Bhadoria, Mr. M. Basu and Dr. S. C. Mahapatra Nutrient Management Software 1.0 (NMS 1.0)
4. Prof. P. B. S. Bhadoria, Mr. M. Basu and Dr. S. C. Mahapatra Intercropping Software 1.0 (ICS 1.0)

### SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

1. Rural Technology Action Group (RuTAG) One day
G. S. SANYAL SCHOOL OF TELECOMMUNICATIONS

HEAD : Professor Saswat Chakrabarti

FACULTY

Professor :

Chakrabarti, Saswat Ph.D., Error Control Coding Wireless Communication

Assistant Professor :

Kundu, Sumit Ph.D., Wireless Communication

Emeritus Professor :

Gangopadhyay, Ranjan Ph.D., Optical Communication Wireless Communication

Officer :

Ratnam, Jayashree M.Tech., Optical Communication Networks

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Faculty Promotion :

Prof. Saswat Chakrabarti Professor

Faculty Resignation :

Dr. Sumit Kundu Assistant Professor

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities :

Wireless Communication and Networks : Channel Estimation and Equalization Methods for OFDM; Multi-Symbol Encapsulated OFDM Systems; Turbo Equalization for Channels with ISI and Fading; Multi-user Detection; Multi-band OFDM-based Ultra Wide Band Systems; Development of OFDM-based Acoustic Link; QoS-enabled Routing in Mobile Adhoc Networks; Wireless Sensor Networks, Software Radio.

Optical Networks : PHY and MAC Layer Issues in WDM-based Optical Access Networks including Active and Passive Architectures; Code Design for Multidimensional Optical CDMA; Radio over fiber-based wireless access networks.
Signal Processing for Communications: Distributed Video Coding for Noisy Channels; Biomedical Signal Processing and Telemetry; Detection Systems for Radar Signals with non-Gaussian disturbances; Integrated Schemes for Error Correction and Message Authentication; Neuro-fuzzy Equalization of Wide-band Non-linear Fading Channel

Thrust Areas:

1. Wireless Communications and Networks
2. Software Radio

New Acquisitions:

Software: Design toolset ‘System Studio Z-2006.12’ from “Synopsys”, India

ON-GOING RESEARCH PROJECTS

Sponsored Projects:

<table>
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<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
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<tbody>
<tr>
<td>1</td>
<td>Design and Development of a Telecom Convergence Switch</td>
<td>Santech Communication Pvt. Ltd.</td>
<td>Rs. 100.00 Lakhs</td>
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<tr>
<td>2</td>
<td>Development of Autonomous Underwater Vehicle</td>
<td>Department of Ocean Development, New Delhi</td>
<td>Rs. 96.00 Lakhs</td>
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Consultancy Projects:

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<td>1</td>
<td>Techno-economic Feasibility Study of Hindustan Cables Limited</td>
<td>Ministry of Heavy Industries, New Delhi</td>
<td>Rs. 39.00 Lakhs</td>
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</table>

INVITED LECTURES BY FACULTY MEMBERS

1. Prof. Ranjan Gangopadhyay
   Nonlinear Polarization Self Switch based on Semiconductor Optical Amplifier (Department of Electronics and Information Engineering, Osaka University, Japan) July 3, 2007

LECTURE BY VISITING EXPERT

1. Prof. R. E. Blahut, University of Michigan, USA
   Error Control Coding

THESES (Doctoral and MS)
# Name of Scholar | Title of Thesis
--- | ---

**PATENTS GRANTED**

1. Prof. R. V. Raja Kumar and Mr. Jinesh P. Nair | “Optimal training sequence and channel estimation method and system for superimposed training based OFDM systems”
Indian patent filed under No. 333/KOL/2008 dated 25.02.08 at the Patent Office, Kolkata

**SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED**

1. Short Term Course on “Wireless Communication & Networks” IIT Kharagpur May 14-19, 2007
2. Short Term Course on “DSP Tools & Practice”, IIT Kharagpur June 4-9, 2007
RAJIV GANDHI SCHOOL OF INTELLECTUAL PROPERTY LAW

HEAD : Professor Subhasish Tripathy

FACULTY

Assistant Professor :

Bandhyopadhyay, Tapas  ME, Ph.D., Composite Materials
Chugh, Archana  M.Sc., Ph.D., Biotechnology and IPRs
Dube, Dipa  LLM, Ph.D., Criminal Laws
Dube, Indrajit  LLM, Ph.D., Corporate Laws
Padmavati, M.  M.Sc., Ph.D., Plant Molecular Biology
Raju, K. D.  LLM, M.Phil., Ph.D., International Law

Lecturer :

Dutta, Ashirbani  LLM, Human Rights

Visiting Faculty :

Nandy, Sujit Kumar  LLB, Procedural Laws

Adjunct Faculty :

Ganguli, Prabuddha  Ph.D., Intellectual Property Laws
Mitra, S. K.  Ph.D., Intellectual Property Laws
Chakraborty, Nirmal  Ph.D., Criminal Procedural Laws
Kumar
Chatterjee, B. K.  LLB, Property Laws
Hon’ble Justice
Banerjee, Umesh C.  LLB, Labour Laws
Pangrle, Brian  Ph.D., Patent Laws

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Faculty Appointment :

Dr. Archana Chugh  Assistant Professor
Dr. Dipa Dube  Assistant Professor
Dr. Indrajit Dube  Assistant Professor
Dr. K. D. Raju  Assistant Professor
Ms. Ashirbani Dutta  Lecturer
Mr. Sujit Kumar Nandy  Visiting Faculty
RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities:

1. Research Projects in diverse areas of Law
2. Organization of Workshops/Training Programmes in IP
3. Preparation for Upcoming International Corporate Law Conference

Thrust Areas:

1. Intellectual Property – Law and Practice
2. Corporate Legal System
3. Justice System
4. International Law

ON-GOING RESEARCH PROJECTS

Sponsored Projects:

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<td>1</td>
<td>Role of phenylpropanoids and flavonoids in defense response in maize</td>
<td>DST, New Delhi</td>
<td>Rs. 15.00 Lakhs</td>
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<td>2</td>
<td>Intellectual Property Law and Competition Law and Practice</td>
<td>World Bank</td>
<td>Rs. 6.30 Lakhs</td>
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<td>3</td>
<td>Women in BPO Sector</td>
<td>IIT Kharagpur</td>
<td>Rs. 1.01 Lakhs</td>
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<td>4</td>
<td>Status Report of Service Conditions, Benefits and Hazards of Working Women in Karnataka &amp; West Bengal</td>
<td>Ministry of Labour &amp; Employment, New Delhi</td>
<td>Rs. 3.03 Lakhs</td>
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<td>5</td>
<td>Agricultural Biotech Invention resource</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
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VISITS ABROAD BY FACULTY MEMBER

1. Dr. Indrajit Dube CLTA Conference, Sydney, Australia, February 2008

INVITED LECTURES BY FACULTY MEMBERS

1. Dr. Manchikanti Padmavati Impact of WTO Ministerial meeting: The Agreement on Agriculture and its impact – WTO and IPR workshop, IICM, Ranchi
2. Dr. Manchikanti Padmavati Online class lectures - ‘Principles of IP’ and IP in open innovation engineering – Georgia Tech University, US
3. Dr. K. D. Raju Alternate Dispute Resolution, US Embassy Programme, Dhenkanal Law College, Orissa
4. Dr. K. D. Raju Law on Venture Capital Investments,
5. Dr. Ashirbani Dutta  
   Development Induced Displacement, Asiatic Society, Kolkata
6. Dr. Indrajit Dube  
   The challenges of formulating legal remedies against emerging growth of Cyber Crime, Kolkata
7. Dr. Dipa Dube  
   Pragmatic Approaches towards Application of Criminal Law in Intellectual Property Crimes, Haldia

**LECTURE BY VISITING EXPERT**

1. Mr. Jim Patterson, Patent Associate, Lee & Hayes LLP, Spokane, Washington, USA  
   Lectures on Patent Drafting
2. Prof. Mark Perry, University of Western Ontario, Canada  
   Is Reformation of Copyright Legislation for WIPO Copyright Treaty Compliance “a Good Idea”?
3. Prof. Imtiaz Omar, University of New England, Australia  
   Contribution of the Privy Council’s Judicial Committee during Colonial Rule in India and Australia
4. Prof. Ananda Mohan Chakraborty, University of Illinois, USA  
   Creating Intellectual Property from Academic Research : A Personal Journey

**THESES (Doctoral and MS)**

<table>
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<th>#</th>
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<tr>
<td>1</td>
<td>Pareta Deepesh</td>
<td>Quantitative Patent Analysis of Nanotechnology &amp; its Patentability Issues</td>
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<tr>
<td>2</td>
<td>Gucchait Shantanu</td>
<td>Registration of Non-Traditional Trademarks in India</td>
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<td>3</td>
<td>Hait Ajit Kumar</td>
<td>Harmonization of Fair Use Principles in Copyright</td>
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<td>4</td>
<td>Yenigalla Anshuman</td>
<td>Cyberstalking</td>
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<td>5</td>
<td>Bhola Deepa</td>
<td>Microfluidic devices for nucleic acid amplification: An analysis of patents on PCR</td>
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<td>6</td>
<td>George P.</td>
<td>Patent analysis of Western ghat plants: Knowledge and material piracy issues</td>
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<td>7</td>
<td>Basu Suddha Sattwa</td>
<td>Analysis of trade dress in the fore of Indian Trade Mark law</td>
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<td>8</td>
<td>Adhikari Satyajit</td>
<td>TRIPs and Human Rights</td>
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<tr>
<td>9</td>
<td>Ghosh Sudipto</td>
<td>Data Exclusivity</td>
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<tr>
<td>10</td>
<td>Khasnis Yogesh</td>
<td>Patent Valuation</td>
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<tr>
<td>11</td>
<td>Dixit Vikas</td>
<td>Patenting Issues in E commerce</td>
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<tbody>
<tr>
<td>1.</td>
<td>Dr. Indrajit Dube</td>
<td>Environmental Jurisprudence</td>
<td>Lexis Nexis, Butterworths</td>
<td>2007</td>
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<tr>
<td>2.</td>
<td>Dr. K. D. Raju</td>
<td>GMO-Emerging Law and Policy in India</td>
<td>Teri</td>
<td>2007</td>
</tr>
<tr>
<td>3.</td>
<td>Dr. Ashirbani Dutta</td>
<td>Development Induced Displacement and Human Rights</td>
<td>Deep &amp; Deep</td>
<td>2007</td>
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<td>4.</td>
<td>Dr. Dipa Dube</td>
<td>Rape Laws in India</td>
<td>Lexis Nexis, Butterworths</td>
<td>2008</td>
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<tr>
<td>5.</td>
<td>Dr. M. Padmavati</td>
<td>Photosynthetic plants as renewable energy sources in Biofuels Refining and Performance (Chapter)</td>
<td>McGrawHill</td>
<td>2008</td>
</tr>
<tr>
<td>7.</td>
<td>Dr. Dipa Dube</td>
<td>Humanizing the Criminal Justice System: The Victim Perspective in Issues in Human Rights (Chapter)</td>
<td>Atlantic Publishers</td>
<td>2008</td>
</tr>
</tbody>
</table>

**LAURELS & DISTINCTIONS**

1. Dr. M. Padmavati  
   Reviewer for Pharma and Biotech - Journal of Intellectual Property Rights

2. Dr. K. D. Raju  
   External Examiner, NALSAR, Hyderabad
SCHOOL OF INFORMATION TECHNOLOGY

HEAD : Professor Indranil Sen Gupta

FACULTY

Professor :


Associate Professor :

Gupta, Arobindo  Ph.D. (Iowa), Distributed Systems
Mandal, Chitta Ranjan  Ph.D., Digital System Synthesis, Internet Technologies, VLSI, System Verification
Sural, Shamik  Ph.D. (Jadavpur University), Information and System Security, Image & Video Processing

Assistant Professor :

Samanta, Debasis  Ph.D. (IIT Kharagpur), Human Computer Interaction, Software Testing, Low Power VLSI Circuit Synthesis
Sreenivasa Rao, Krothapalli  Ph.D.(IIT Madras), Speech Processing, Neural Networks
Misra, Sudip  Ph.D.(Carleton University, Canada), Computer Networks, Software Engineering

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Faculty Appointment :

Dr. Sudip Misra  Assistant Professor

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities :

Geographical Information System : Enterprise wise 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 : Researches are going on to develop adaptive user interface
design and automatic usability evaluations with simulated human user. Interface in Indian languages are under development to support physically disabled people.

**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**:

i) Distributed systems  
ii) E-Learning and E-Commerce  
iii) Mobile computing  
iv) Ubiquitous computing  
v) Data mining  
vi) Systems security  
vii) Adhoc sensor networks  
viii) Network security  
ix) Human computer interaction  
x) Geographical information system  
xi) Computer vision  
xi) Information and database systems  
xx) VLSI design

**New Acquisitions**:

Under initial funding from Headquarters Integrated Defense Staff, Ministry of Defense, New Delhi, a Centre of Excellence in Information Assurance has been set up in the SIT premises. Four research staff are working under the Centre in various areas of cryptography and network security. Under the proposal, an Industry Consortium will be set up where industry partners will be providing a common pool of fund to further promote R&D activities in this area and also to make the Centre self-reliant in the long run. Prof. Indranil Sen Gupta is the overall in-charge of the centre.

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects**:

<table>
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<tr>
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<th>Title of the Project</th>
<th>Sponsor(s)</th>
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<tbody>
<tr>
<td>1</td>
<td>A web-based distributed multimedia</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
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</table>
GIS for analysis and visualization of Geo-databases
2. An Integrated Framework for Testing Object-Oriented Programs DST, New Delhi Rs. 10.00 Lakhs
3. Content-Based Information Retrieval from Multimedia Databases IIT Kharagpur Rs. 2.88 Lakhs
4. Development of an Enterprise GIS based on open GIS standards DST, New Delhi Rs. 40.50 Lakhs
5. DSM-Aware Synthesis of Low Power Circuits Intel, USA Rs. 10.00 Lakhs
6. Microsoft Lab Setup Microsoft Corporation, USA Rs. 35.00 Lakhs
7. Middleware for Building Mobile Agent Based Distributed Applications MHRD, New Delhi Rs. 6.00 Lakhs
8. Modeling and Management of Dynamic Multimedia Objects DST, New Delhi Rs. 18.00 Lakhs
9. Online Authentication Checking System with IRIS Biometric Scheme IIT Kharagpur Rs. 3.00 Lakhs
10. Properties of High Dimensional Euclidean Space and their Applications in Approximate Nearest Neighbor Search on Multimedia Databases DST, New Delhi Rs. 3.30 Lakhs
11. Survivable Information systems Architecture with Intrusion tolerance, Containment and Recovery in Distributed Environment DIT, New Delhi Rs. 55.00 Lakhs
12. Development of Multimodal User Interface to Internet for Common People in India DIT, New Delhi Rs. 58.00 Lakhs
13. DSM/UDSM-Aware Synthesis for Low-Power High-Performance CMOS VLSI Circuits CSIR, New Delhi Rs. 14.00 Lakhs
14. Efficient Index-supported Multimedia Search on the Internet DST, New Delhi Rs. 6.38 Lakhs
15. Enhanced SANYOG: A Portable Communication Tool for the Speech and Neuro Motor Impaired People Media Lab Asia, USA Rs. 71.00 Lakhs
16. Design & Development of Models & Tools for Vulnerability Assessment of Embedded Systems Min. of Defense, GOI Rs. 49.20 Lakhs
17. Characterization and incorporation of emotions in speech IIT Kharagpur Rs. 3.00 Lakhs
18. Development of Spatio-temporal Access Control Models DST, New Delhi Rs. 16.18 Lakhs

Consultancy Projects :

# Title of the Project Sponsor(s) Amount
1. Placement and Routing of Analog Test National Rs. 22.00 Lakhs
Structures Semiconductor Corporation, USA

2. Development of parameterized templates and R-extraction tools National Semiconductor Corporation, USA Rs. 153.00 Lakhs

3. Design and Development of a Penetration Testing and Security Assessment Tool Min. of Defense, GOI Rs. 49.00 Lakhs

4. GM-CRL, IIT Kharagpur-VANET Communication and Security Group General Motors Rs. 500.00 Lakhs

VISITS ABROAD BY FACULTY MEMBER

1. Dr. Shamik Sural Research related discussions (Michigan State University, USA) November 2-11, 2007
2. Dr. Soumya Kanti Ghosh Presenting paper / Session Chair in IMECS-2008 Conference (Hong Kong) March 19-21, 2008
3. Dr. Arobindo Gupta Attending Microsoft Research Faculty Summit (Microsoft Research, USA) 3 days

INVITED LECTURES BY FACULTY MEMBERS

1. Dr. Shamik Sural Damage Assessment and Recovery of a Database after Attack (Department of CSE, Michigan State University, USA)
5. Dr. Sudip Misra Invited Keynote Lecture, Second International Conference on Resource Utilization and Intelligent Systems (INCRUIS 2008) (Erode, Tamil Nadu, India)
6. Dr. Sudip Misra Invited Keynote Speech, International Conference on Systemic, Cybernetics, and
7. Dr. Sudip Misra
   Invited Keynote Lecture, International Conference on Sensors and Related Networks (SENNET 2007) (Vellore, Tamil Nadu, India)

8. Dr. Sudip Misra
   Invited Keynote Address, International Conference on Advances in Information and Communication Technologies (ICICOT07) (Manipal, Karnataka, India)

9. Dr. Sudip Misra

10. Dr. Sreenivasa Rao Krothapalli
    Speech and audio applications on Internet (Andaman and Nicobar Islands, India)

11. Dr. Arobinda Gupta
    An introduction to distributed algorithms (ISM Dhanbad)

THESES (Doctoral and MS)

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Manoj Paul</td>
<td>A Framework for Information Integration of Heterogeneous Geospatial Repositories</td>
</tr>
<tr>
<td>2.</td>
<td>Debasish Kundu</td>
<td>Model-Driven Testing for Object-Oriented systems with Test Case Prioritization</td>
</tr>
<tr>
<td>3.</td>
<td>Somnath Dey</td>
<td>An Efficient Approach to Iris Biometric Processing for Biometric Authentication System</td>
</tr>
</tbody>
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BOOK PUBLISHED

<table>
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<tr>
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<tbody>
<tr>
<td>1.</td>
<td>Dr. S. Misra, Mr. I. Woungang and Prof. S. C. Misra (Eds.)</td>
<td>Handbook of Wireless Ad-hoc and Sensor Networks</td>
<td>Springer</td>
<td>2008</td>
</tr>
<tr>
<td>2.</td>
<td>Dr. S. Misra, Prof. S. C. Misra and Mr. I. Woungang (Eds.):</td>
<td>Handbook of Wireless Mesh Networks</td>
<td>Springer</td>
<td>2008</td>
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LAURELS & DISTINCTIONS

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<thead>
<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Distinction</th>
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<tbody>
<tr>
<td>1.</td>
<td>Dr. Debasis Samanta</td>
<td>Microsoft Valued Professional Award, Microsoft Inc., USA</td>
</tr>
</tbody>
</table>
HEAD : Professor Ajoy Kumar Ray

FACULTY

Assistant Professor :

- Chaudhury, Koel Ph.D., Reproductive Health
- Mahitosh Mandal Ph.D., Cancer Biology
- Bhattacharya, Sangeeta D. Ph.D., Pediatric HIV
- Mitra, Analava Ph.D., Neutraceuticals and Herbal medicine
- Chatterjee, Jyotirmoy Ph.D., Medical Imaging & Analysis, Radiation Biology, Eco-friendly medicine, Wound research
- Manjunatha, M. Ph.D., Bio-Medical Instrumentation
- Soumen Das Ph.D., Bio-MEMS & Medical Electronics
- Santanu Dhara Ph.D., Biomaterials

Senior Lecturer :

- Chakraborty, Chandan Ph.D., Medical Statistics & Statistical Pattern Recognition

Visiting Faculty :

- Chakravarty, B. N. Reproductive Health
- Banerjee, Pravas Wound Research
- Bhattacharya, Parthasarathi MD, DNB, DM, Pulmonary Medicine
- Bhattacharya, Pinak Pani MD, Radiodiagnosis

Emeritus Professor :

- Guha, Sujoy K. Ph.D., MBBS, Rehabilitation Engineering, Medical Instrumentation, Application of Biomedical Engineering to Reproductive Medicine, Patient Care Systems

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities :

1. Medical Imaging and Automated Diagnostic Tool Development.
2. Medical Instrumentation & Telemedicine
3. Biomaterials, wound research
4. Herbal medicine & Cancer drug development
5. Technology in Reproductive Health
New Cancer Drug Development
7. Oxidative Stress in infertility
8. Proteomics in Reproductive Health
9. Contraceptive Development

Thrust Areas :

1. Medical imaging and automated diagnostic tool development.
2. Biomaterials and Wound Research.
3. Medical Imaging & Image Processing
4. Medical Instrumentation
5. Bio-MEMS
6. Medical Statistics & Pattern Recognition
7. Medical Expert System
8. Telemedicine
9. Cognitive & Neuro Science
10. Tissue Engineering
12. Health Care Management
15. Technology in Reproductive Health

New Acquisitions :

1. Picture Archival Communication System
2. Fluorescence Microscope
3. 4D Colour Doppler
4. Atomic Force Microscope
5. Semi-Auto analyzer for biochemistry

ON-GOING RESEARCH PROJECTS

Sponsored Projects :

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Expression of collagen types during pathological manifestation of OSF – A precancerous condition</td>
<td>DST, New Delhi</td>
<td>Rs. 20.00 Lakhs</td>
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<tr>
<td>2</td>
<td>Non-linear dynamics &amp; time series analysis of respiratory rhythms</td>
<td>DST, New Delhi</td>
<td>Rs. 20.00 Lakhs</td>
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<td>3</td>
<td>Role of Disabilities and Individual Characteristics of Workers on Occupational Injuries in Mines</td>
<td>DST, Government of West Bengal</td>
<td>Rs. 12.26 Lakhs</td>
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<td>4</td>
<td>Development of MEMS vaporising liquid microthruster for applications at ISRO</td>
<td>ISRO-KCSTC Cell</td>
<td>Rs. 22.00 lakhs</td>
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<tr>
<td>5</td>
<td>Evaluation of S100A7 (Psoriasin) as an</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
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</tbody>
</table>
Early Detection Bio-Marker of Squamous cell Carcinoma

6. Impact of Follicular Fluid and IVF Media-Generated Oxidative Stress on Oocyte Maturation, Fertilization and Subsequent Embryo Development  
   DBT, New Delhi  Rs. 9.27 Lakhs

7. Immunological abnormalities in patients with cervical cancer: analysis of peripheral blood lymphocytes  
   DST, New Delhi  Rs. 6.72 Lakhs

8. Assessment of membrane characteristics and oxidative stress-induced DNA damage in human sperm for Intra Cytoplasmic Sperm Injection  
   DBT, New Delhi  Rs. 15.38 Lakhs

9. National Centre for the Technological Evaluation of IUD and Tubal Rings  
   Ministry of Health & Family Welfare, New Delhi  Rs. 150.00 Lakhs

10. Artificial Heart Development Programme  
    DST, New Delhi  Rs. 8.16 Lakhs

11. Development of “Palposcope” for Medical Diagnostic Kit and Telemedicine  
    DST, New Delhi  Rs. 11.37 Lakhs

12. Surgical Injection Device with Imaging and Force Feedback Active Guidance  
    DST, New Delhi  Rs. 8.00 Lakhs

13. Early detection of Oral & Breast Cancer through multi-modal imaging & analysis and MEMS based flow sensor  
    Texas Instruments, USA  Rs. 92.00 Lakhs

14. Development of Medical Expert System for Screening & Diagnosis of Coronary Artery Diseases  
    VECC, DAE, Govt. of India  Rs. 43.20 Lakhs

15. Impact of Follicular Fluid and IVF Media-Generated Oxidative Stress on Oocyte Maturation, Fertilization and Subsequent Embryo Development  
    DBT, New Delhi  Rs. 9.27 Lakhs

16. Web enabled medical information access using handheld devices in a wireless environment for telemedicine application  
    MCIT, New Delhi  Rs. 62.10 Lakhs

17. Understanding the impact of pediatric HIV-1 infection on childhood immunization coverage in WB  
    IIT Kharagpur  Rs. 3.00 Lakhs

18. Laser Speckle Imaging of Bloodflow in Microcirculation  
    IIT Kharagpur  Rs. 5.00 Lakhs

19. Development of Embedded System Based on DSP and FPGA for X-ray Cone-beam Computed Tomography  
    VECC, Kolkata  Rs. 40.00 Lakhs

20. Development of Scaffold for Tissue Engineering  
    IIT Kharagpur  Rs. 5.00 Lakhs

21. Synthesis, Development and Invitro characterization of bio-inert Yttria/Ceria coated/Stabilized ZrO2 toughened  
    DBT, New Delhi  Rs. 32.60 Lakhs
Alumina composite for biomedical application

22. Feasibility study of MEMS based biochip platform for characterization of biospecies  
   IIT Kharagpur  
   Rs. 5.00 Lakhs

23. Development of novel nano-bio-composite osteogenic matrices for cell based bone tissue engineering  
   -  
   Rs. 21.60 Lakhs

24. Characterization of Indian Honey & its Integration with Wound Dressing System  
   IIT Kharagpur  
   Rs. 3.00 Lakhs

   IIT Kharagpur  
   Rs. 1.00 Lakh

Consultancy Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Assistance for RISUG Making</td>
<td>-</td>
<td>Rs. 11.33 Lakhs</td>
</tr>
</tbody>
</table>

INVITED LECTURES BY FACULTY MEMBERS

1. Prof. Ajoy K Ray  
   ‘Sir Ronald Ross Memorial lecture’ at IPGMER, Kolkata (2007).

2. Mahitosh Mandal  
   “Engineering tumours with 3D silk protein based matrices” in the workshop on ‘Cell based tissue engineering using natural polymers’ at Gwangju Institute of Science and Technology (GIST), Republic of Korea (Nov 29, 2007).

3. Mahitosh Mandal  
   “S100A7 (Psoriasin) Identified as an Anoikis Resistant Gene and Early Detection Marker of Squamous Cell” , Bhubaneshwar, India.

4. Analava Mitra  

5. Dr. Santanu Dhara  
   ‘Rheology of Alumina ceramics & their use in gelation forming of dense & porous ceramics’ at CGCRI, Kolkata (2007)

6. Dr. Jyotirmoy Chatterjee  
   “Molecular Imaging” in the seminar – workshop on Diagnosis & Management of Genetic Disorders at School of Biotechnology, West Bengal University of Technology, Kolkata (Dec 27, 2007)

7. Dr. Koel Chaudhury  
   ‘Role of reactive oxygen species in human infertility” in the 95th Indian Science Congress held at Andhra University,
8. Dr. Koel Chaudhury  
   ‘Optimal level of ROS as a predictive marker of sperm quality and fertilization outcome in ICSI” in the National Workshop on Recent Advancements in Infertility Treatment Strategies held at A.H. IVF & Infertility Research Centre (P) Ltd. Ranchi.

9. Dr. Sangeeta Das Bhattacharya  
   US NIH Grant Writing Workshop on HIV., Hyderabad.

10. Dr. Soumen Das  
    Quartz Micromachining, IIT, Kharagpur. (28th May – 2nd June, 2007).

11. Dr. Soumen Das  

12. Dr. Chandan Chakraborty  

LECTURE BY VISITING EXPERT

1. Prof. (Dr.) S. P. Mukhopadhyay, Strategic Management of Health Care Services, IISWBM  
   Hospital finance Health Insurance (April 13, 2007) and  
   Concept Issues & Economics of Health Care Management (April 14, 2007)

2. Prof. Sandip Ghosh, Strategic Management of Health Care Services, IISWBM  
   Strategic Management of Health Care Services (April 14, 2007)

3. Dr. Neeraj Magotra, General Manager, Medical Technology Development, Texas Instruments, Dallas, USA  
   Energy efficient solution to medical instrumentation design (September 27, 2007)

4. Dr. Kripamoy Aguan, Sr. Research Scientist, Brain Science Institute, RIKEN Japan  
   Astroglial basis of epilepsy : a new paradigm (October 12, 2007)

5. Dr. Madhurjya Gogoi, All India Institute of Medical Sciences, New Delhi  
   Ophthalmology (November 08, 2007)

6. Dr. Sandeep Chatterjee, Neuro Surgeon  
   Initiating Neuroscience and Technology Research (November 11, 2007)

7. Dr. Monotosh Panja, Head, AMRI Hospital and Dr. Sushan Mukherjee, MS, MCH, Chief Cardio Thoracic Surgeon, AMRI Hospital and Director, Indian Medical Promotion Unit  
   Preventive cardiology (March 26, 2008)

8. Dr. B. N. Chakraborty, Institute of Reproductive Medicine, Salt Lake, Kolkata  
   Embryonic stem cell research in India (April 26, 2008)

9. Dr. B. Mitra, Managing Director, TI  
   Impacting lives through technology
India Pvt. Ltd.

innovation: A once in a generation opportunity

10. Dr. C. S. Bal, AIMS, New Delhi
    PET – An advanced imaging technique
    Thyroid cancer detection & treatment

11. Dr. S. Kuppig, Germany
    Basic principle and scope of application of confocal laser scanning microscope

12. Dr. M. K. Dewanjee, Scientist, Department of Health & Human Services, NIH Campus, USA
    Cardiovascular diseases, prevention, diagnosis and therapy

THESES (Doctoral and MS)

<table>
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<tr>
<th>#</th>
<th>Name of Scholar</th>
<th>Title of Thesis</th>
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<tbody>
<tr>
<td>1.</td>
<td>Sunil Kumar</td>
<td>Micro-structural and biochemical changes in human Spermatozoa associated with RISUG®</td>
</tr>
</tbody>
</table>

LAURELS & DISTINCTIONS

| 1. | Dr. Koel Chaudhury | Reviewer of Journal of Assisted Reproduction and Genetics |
VINOD GUPTA SCHOOL OF MANAGEMENT

HEAD : Professor Probir Kumar Gupta

FACULTY

Professor :

Gupta, Probir K.  B.Tech. (Hons.) (IIT Kharagpur), Organisational Development, Business Strategies
Sinha, Gautam  Ph.D.(IIT Kharagpur), Production and Industrial Engineering and Management
Guin, Kalyan K.  B.Tech. (BHU), Fellow (IIM, Bangalore), Marketing, Operations Management, Entrepreneurship, Quantitative Techniques
Srinivasan, S.  Ph.D.(IIT Kharagpur), Finance and Production Management
Sadhu, Amar N.  M.A. (London), FCA (Eng & Wales), FIMC (London), MISP (London), Economics and Finance

Associate Professor :

De, Sadhan K.  Ph.D. (Manchester), Information Systems, ERP, E-Business/E-Commerce, Business Intelligence, Technology Management Strategic Management
Rajib, Prabina  Ph.D. (IIT Kharagpur), Finance, Risk Management
Roy, Santanu  Ph.D. (IIT Kharagpur), Technology and Innovation Management, Quantitative Methods, Organisational Behaviour

Assistant Professor :

Datta, Biplab  Ph.D. (IIT Delhi), Marketing
Mishra, Chandra Sekhar  Ph.D.(Utkal University), Finance, Accounting
Pradhan, Rudra  Ph.D. (IIT Kharagpur), Econometric Modelling
Prakash  Sahney, Sangeeta  Ph.D. (IIT Delhi), Marketing Management, Human Resource Management, Quality Management in Services
Mukhopadhyay, Susmita  Ph.D. (Calcutta University), Organizational Behaviour, Human Resource Management, Business Ethics and Human Values
Misra, Arun K.  Ph.D. (IIT Bombay), Financial Marketing, Banking

Visiting / Adjunct Faculty :

Sarbadhikary, Sanjay K.  B.Com. (Hons.), M.Com., LLB/BL (Calcutta University),
Managerial Accounting

Das, Purnendu Sekhar Ph.D. (IIT Kharagpur), Personnel Management, Industrial Relations, Legal Aspects

Datta, Saroj Kumar Ph.D. (University of Burdwan), Strategic Management and Marketing

Mukherjee, Prithwish Ph.D. (IIT Kharagpur), M.S. (University of Texas), Information System, Information Technology

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Faculty Appointment :
Dr. Susmita Mukhopadhyay Assistant Professor
Dr. Rudra Prakash Pradhan Assistant Professor
Dr. Chandra Sekhar Mishra Assistant Professor
Dr. Arun Kumar Misra Assistant Professor
Dr. Saroj Datta Visiting Faculty

Faculty Promotion :
Dr. Prabina Rajib Associate Professor

RESEARCH AND DEVELOPMENT

Thrust Areas :
1. Foreign Direct Investment and Financial Markets,
2. Manufacturing in Small and Medium Enterprises

ON-GOING RESEARCH PROJECTS

Sponsored Projects :

<table>
<thead>
<tr>
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<th>Title of the Project</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Implementation of a Quality Management System for all Programmes of IIT Kharagpur</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
</tr>
<tr>
<td>2</td>
<td>Impact of Select Issues in Consumer Demographics and Psychographics on Online Buying Behaviour</td>
<td>IIT Kharagpur</td>
<td>Rs. 3.00 Lakhs</td>
</tr>
<tr>
<td>3</td>
<td>Socio Economic Development</td>
<td>IIT Kharagpur</td>
<td>Rs. 1.65 Lakhs</td>
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Consultancy Projects :
# Title of the Project                      Sponsor(s)                      Amount
1. Corporate Governance and Corporate     Jindal Bengal Steel Ltd.        Rs. 0.43 Lakhs
    Social Responsibility Report – A

VISITS ABROAD BY FACULTY MEMBER
1. Prof. Gautam Sinha                   Design and Delivery of Training Program (Qatar Steel, Doha, Qatar)
2. Dr. Sangeeta Sahney                  2008 International Conference on E-Commerce (Bangkok) March 27-29, 2008

INVITED LECTURES BY FACULTY MEMBERS
1. Dr. Sangeeta Sahney                   Globalisation : Challenges Before Indian Marketers – Rourkela Institute of Management Studies, Rourkela
2. Dr. Susmita Mukhopadhyay             Career Planning and Psychological Satisfaction in Retired Life and Orienting Family Members for a Positive Approach – Indian Oil Corporation Limited
3. Dr. Susmita Mukhopadhyay             Goal Setting and Motivating Self-Indian Ethos – Indian Oil Corporation Limited
4. Dr. Susmita Mukhopadhyay             Schedule Design for Psychological and Educational Survey Research – Psychology Research Unit, Indian Statistical Institute, Kolkata (As Resource Person for the Seminar)
5. Dr. Susmita Mukhopadhyay             Academic Career Excellence in Management - Pailan College of Management and Technology
6. Dr. Susmita Mukhopadhyay             Self Development – Air Force Station Salua
7. Dr. Susmita Mukhopadhyay             Interpersonal Skills – UAL Bengal
8. Dr. Biplab Datta                     4Ps of Marketing in Small Industries Management Programme (SIMAP) – IIT Kharagpur
9. Dr. Sadhan K. De                     ‘ERP and SCM’, ‘World Class Supply Chain Management’ – AICTE sponsored Faculty Development Program at MIM, Ujjain, MP
10. Dr. Sadhan K. De                    ‘Understanding and Managing Innovation’ – Invited talk for the senior executives of Tata Refractories Ltd., Belpahar, Orissa
11. Dr. Sadhan K. De                    Taught a course “Information Security and Risk Management” in XLRI, Jamshedpur
12. Dr. Sadhan K. De                    Taught a course on “MIS and ES” at IIM Lucknow
13. Dr. Sadhan K. De                    Taught a course on ERP at XLRI, Jamshedpur
14. Dr. Sadhan K. De
   Understanding and Managing Innovation at NSHM

15. Dr. Sadhan K. De
   General Management Program for Defense Officers (GMDP) on invitation from XLRI, Jamshedpur

16. Dr. Prabina Rajib
   Emerging Trends in Capital Market, Bhubaneswar Stock Exchange

**LECTURE BY VISITING EXPERT**

1. Mr. Arnab Bose, Senior Vice President – International Business, SREI
   Asset Reconstruction in India

2. Mr. Anand Chatterjee, SCM Consultant, SAP
   Supply Chain Management

3. Mr. Samar Singh Sheikhowat, Vice President – Marketing, RPG Retail Pvt. Ltd.
   Retail Marketing

4. Prof. P. K. Banerjea, ICFAI Business School, Pune
   Technology Management

5. Prof. B. B. Chakravarti, Professor of Finance & Accounts, IIM Calcutta
   Futures and Options : An Introduction to Derivatives

6. Dr. Tuli Roy, General Manager, RBI
   Basel I and Basel II

7. Dr. M. P. Sunder, Group Manager – Brands & Communication, WIPRO
   Art and Science of Brand Management

8. Mr. Shouvik Bhattacharya, Adea International Pvt. Ltd.
   Strategic Planning

9. Mr. Roopen Roy, Managing Director, PWC
   Service Sector in India

10. Mr. Biswadeep Gupta, Managing Director, Indian Unit of Vesuvius Ltd.
    Manufacturing and Entrepreneurship

11. Mr. Partho S. Datta, Independent Consultant
    Regaining Agricultural Dynamism

12. Mr. Alok Mookherjea, Chairman, WBEIDCL
    (1) Indian Brand Equity
    (2) Leadership

13. Prof. Pitabas Mohanty, Professor, XLRI, Jamshedpur
    Financial Modelling using MS Excel

**THESES (Doctoral and MS)**

<table>
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<tr>
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<tr>
<td>1.</td>
<td>B. Rajesh Kumar</td>
<td>An Analytical Study on Mergers in India</td>
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<tbody>
<tr>
<td>1</td>
<td>V. Raghunathan and Dr. Prabina Rajib</td>
<td>Stock Exchanges, Investments &amp; Derivatives</td>
<td>Tata McGraw Hill India</td>
<td>2007</td>
</tr>
<tr>
<td>4</td>
<td>Dr. Sadhan K. De</td>
<td>Book Chapter on “Competitiveness and Technology Innovation; Strategic Innovation and Customer Power” for developing Master of Technology Management Course in DSIR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Dr. Prabina Rajib</td>
<td>Stock Exchanges, Investments And Derivatives: Straight Answers to 250 Nagging Questions (3rd Edition) jointly with Dr. V. Raghunathan</td>
<td>Tata McGraw Hill India</td>
<td>June 2007</td>
</tr>
</tbody>
</table>

**SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED**

1. Customer Satisfaction, Communications and Outreach 5 days
2. Indian Share Market 1 day
3. Share Trading : Nuts & Bolts 2 days
4. OCCASIO : VGSOM’s Management Fest 2 days
5. PURVODAYA : The Ascent of East 2 days
CENTRALIZED UNITS AND SERVICES & ALUMNI AFFAIRS & INTERNATIONAL RELATIONS
The various activities of the office of the Dean of Alumni Affairs & International Relations over the past one year are as follows:

1. The alumni affairs website with a link to the institute website facilitates alumni all over the globe to register online at www.alumni.iitkgp.ernet.in. A new website will get operational soon, which will provide social networking opportunities among the Alumni, students, and faculty.

2. An extremely popular Alumni newsletter “KGPian” is being published regularly every three months. Presently it is running in its 5th year.

3. For the first time Mr. Ranbir “Ron” Singh Gupta, an alumnus pledged $1 Million to IIT Kharagpur for development of a School of Infrastructure which will be called Ranbir & Chitra Gupta School of Infrastructure Design and Management (RCG INFRATECH). The MOU for this was signed during the inaugural ceremony of the Alumni Meet.
4. PAN IIT 2007 was held at Santa Clara in the San Francisco Bay Area, USA during 6-8 July 2007. Prof. M. Charkraborty, Dy. Director, Prof. Ajay Chakraborty, Dean (AA&IR) and Prof. Dhrubesh Biswas attended the event.

5. We have had a number of renowned universities coming forward with exchange programmes and the Institute has seen an influx in successful Memoranda of Understanding (MoU) and Memoranda of Agreement (MoA) lately.

**NINA SAXENA EXCELLENCE IN TECHNOLOGY AWARD**

The 57th Foundation Day of the Institute was celebrated on 18th August, 2007. For the first time The Nina Saxena Excellence in Technology Award, a first of its kind India-wide Technical Innovation Award instituted by IIT Kharagpur in 2006 was presented to Dr. S. P. S. Khanuja, Director, Central Institute of Medicinal & Aromatic Plants, Lucknow by the Chief Guest Prof. K. L. Chopra, former Director, IIT Kharagpur. The award consists of a cash prize of Rs. 51,000/- and a gold plated plaque. Commemorating the spirit of Dr. Nina Saxena, B.Tech. (Hons.), ECE 1992, who passed away tragically in 2005, the award is an attempt to encourage and promote technical innovation with a social development focus. The award is the result of a lot of hard work on Nina’s husband, Dr. Akhil Sahai’s part; also our alumnus.

**DISTINGUISHED ALUMNUS AWARD**

Distinguished Alumnus Award was conferred on alumni of IIT Kharagpur who have distinguished themselves in their own domain of work and made their Alma Mater proud during the 53rd Annual Convocation. Prof. Surendra Prasad, Dr. Kirit. S. Parikh, Prof. Punjab Singh, Prof. Prithviraj Banerjee and Prof. Supriyo Datta were awarded the Distinguished Alumnus Awards. Dr. Kirit. S. Parikh received the award in person whereas Prof. Surendra Prasad and Prof Supriyo Datta received the awards subsequently during the 5th Annual Alumni Meet.

**ANNUAL ALUMNI MEET 2008**

The New Year brought together the alumni of the Institute again for the fifth time to IIT in the form of 5th Annual Alumni Meet 2008 held during 5th - 6th January 2008. The Meet was dedicated to those who graduated in the years 1958 and 1983. Many alumni came with their spouses and some with children and even grand children. To commemorate the occasion a Souvenir, “Yearnings of Yore – Volume V” was published. The programme consisted of Inauguration & Award Ceremony, Panel Discussion, Alumni General Meeting, Departmental Reunion, Hall Reunion, Sight Seeing Programme and Sports Events.

**VISIT OF THE ALUMNI**

1. Shri K. N. Rao Visited during June 28-29, 2007 to explore the possibility of joint research programme in the area of EMI, EMC and ESD (June 28–29, 2007)
2. Shri Arjun Malhotra  
To formulate a well-charted plan for R&D activities that will ensure visibility of G. S. Sanyal School of Telecommunication internationally and also to identify thrust areas for the next five years. He also discussed about setting up a Telecom Centre of Excellence at IIT Kharagpur (May 10–11, 2007)

3. Shri C. J. Reddy  
To deliver a talk on electromagnetic simulation tool FEKO. Various antenna design applications using FEKO was examined (November 14, 2007)

4. Shri Asis Nasipuri  
To deliver guest lectures and Discussed for a possible MOU between IIT Kgp and University of North Carolina at Charlotte (October 09–10, 2007)

5. Prof. Avijit Gangopadhyay  
Delivered a lecture to the M.Tech students (CORAL & others) on “Operational ocean modeling for the western north Atlantic in support of building an Integrated Ocean Observation System”. He also met the Director and other faculty members (March 24–26, 2008)

MEMORANDA OF UNDERSTANDING SIGNED

1. Universita degli Studi di Roma “La Sapienza”, Italy
2. University of Massachusetts School of Marine Sciences (UMSMS)
3. University of Padova, Italy
4. Ryukoku University, Japan
5. Friedrich-Alexander University Erlangen-Nuremberg
6. L.C. Smith College of Engineering and Computer Science, Syracuse, USA
7. Gwangju Institute of Science & Technology, Republic of Korea
8. Graduate Institute of Ferrous Technology (GIFT) University of Science and Technology, Pohang, South Korea
9. Chosun University, Republic of Korea

INTERNATIONAL VISITORS

1. Delegation of Royal University of Bhutan  
September 27, 2007
2. Delegation from TOTAL, Institute of Petroleum, France and Spenta Consultants Pvt. Ltd., Indian agent of TOTAL  
October 04–05, 2007
3. French delegation from Nplusi Engineering Institute Paris, France  
November 15, 2007
4. Prof. Kazuhiko Hasegawa, Dept. of OE&NA, Osaka University, Japan  
November 22, 2007
5. Prof. Jerry Y. S. Lin, Professor & Interim chair, Dept. of Chemical Engineering, Arizona State University, USA  
December 18, 2007
6. Delegation from Leibniz University, Hannover, Germany  
February 05, 2008
7. Delegation from Lulea University of Technology, Sweden  
February 07–09, 208
<table>
<thead>
<tr>
<th>No.</th>
<th>Delegation Description</th>
<th>Visit Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>Delegation from University of Saskatchewan, Canada</td>
<td>February 12–14, 2008</td>
</tr>
<tr>
<td>13.</td>
<td>Prof. Cauligi S. Raghavendra, Associate Dean, accompanied by Prof. Priya Vashishta and Prof. Rajiv Kalia, University of Southern California</td>
<td>March 18–19, 2008</td>
</tr>
<tr>
<td>15.</td>
<td>Delegation from European Union, led by the alumnus Mr. Sharad Tripathi, President, IIT EU Alumni Association, with representatives from EADS, IOSIS, AREVA, FLUIDYN</td>
<td>March 31, 2008</td>
</tr>
</tbody>
</table>
ADVANCED TECHNOLOGY DEVELOPMENT CENTRE

CHAIRMAN : Professor Santiram Kal (Upto December 31, 2007)
Professor Partha Pratim Chakrabarti (From January 01, 2007)

FACULTY ASSOCIATED

Professor :

Chakrabarti, P. P. 
Computer Sci. & Engg. 
Advisor, SRIC
Ph.D., Artificial Intelligence, CAD for VLSI Design of Algorithms, Formal Verification

Lahiri, S. K.
Ph.D., Microelectronics, VLSI, MEMS, Integrated optics

Advisor, SRIC
Ph.D., Computer vision, Multimedia

Sengupta, S.
Electronics & ECE
Ph.D., VLSI Design of Power Converters, Industrial Information Technology

Patra, A.
Electrical Engineering
Ph.D., Embedded Systems, Artificial Intelligence application

Basu, A.
Computer Sci. & Engg.
Ph.D., Bifurcation Theory, Chaos, Nonlinear Dynamics

Banerjee, S.
Electrical Engineering
Ph.D., Solid State Physics, thin film, nanotechnology

Roy, S. K.
Physics & Meteorology
Ph.D., Computational geometry, Design and analysis of algorithms

Pal, S. P.
Computer Sci. & Engg.
Ph.D., Corrosion and Surface Protection, Phase Transformation, Nano-cermets, Physical Metallurgy, Surface Engineering, Wear of Metals

Manna, I.
Metallurgical & Materials Engg.
Ph.D., Structural Engineering

Bhattacharya, S.
Civil Engineering
Ph.D., Virology and Molecular Biology

Ghosh, A.
Biotechnology
Ph.D., Bioorganic Chemistry

Basak, A.
Chemistry
Ph.D., Microbial and Plant Biotechnology

Dey, S.
Biotechnology

Assistant Professor :

Bhattacharyya, T. K.
Electronics & ECE
Ph.D., Microelectronics, VLSI, MEMS.

Dhar, A.
Physics & Meteorology
Ph.D., Condensed matter Physics, nanotechnology

Das, S.
Medical Science & Technology
Ph.D., MEMS and Microsystems including Bio-MEMS and Bio-Transducers, Microelectronic devices, Medical Instrumentation and Medical chip design.

Senior Scientific Officer :
Gangopadhyay, Pranabendu
Ph.D., Photonics, Optical Metrology, Optical Materials, MOEMS, Microelectronics.

LABORATORIES INVOLVED IN ATDC
i) Microelectronics Laboratory
ii) MEMS Design Centre
iii) Integrated Optics Laboratory
iv) Kalpana Chawla Space Technology Cell
v) Microscience Laboratory
vi) Advanced VLSI Laboratory
vii) Advanced Laboratory for Plant and Genetic Engineering
viii) Communication Empowerment Laboratory
ix) Optel-IIT Fiber-Optic Center

RESEARCH AND DEVELOPMENT

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. 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. An integrated-optic design software have been developed and copyrighted. Fabrication and characterization of titanium indiffused lithium niobate waveguides, directional couplers, power splitters, switches for fiber-optic communication networks have been performed.

Research is being carried out on thin film nanostructures, semiconductor, ferroelectric and magneto-resistive 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 30 different chips have been fabricated and tested. Collaborative research is going on with many industries like National Semiconductors, Sun, Synopsys and Intel. 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 green house 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:**

i) Inertial MEMS  
ii) Micro Sensors and actuators for automobile, space, and defense applications  
iii) Bio-MEMS  
iv) Semiconductor devices  
v) Nanotechnology  
vi) Lithium niobate integrated optics  
vii) Astrophysics
viii) Cosmology  
ix) Nonlinear Sciences  
x) Theoretical condensed matter physics  
xi) Wireless communication and Baseband processing  
 xii) Analog and RF circuits  
xiii) Plant biotechnology  

**New Acquisitions :**

i) MEMS vaporising liquid micro thruster  
ii) MEMS flow sensors  
iii) Integrated-optic switch  
iv) MEMS accelerometer for aircraft motion sensing  
v) Wafer aligner and substrate bonding machine for MEMS packaging  
vi) LPCVD Furnace  
vii) Tempress Systems  
viii) Infrared Camera for Integrated-Optic applications  

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects :**

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Duration</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>
<td>Ongoing</td>
</tr>
<tr>
<td>2</td>
<td>Development of Silicon Microsensors for Flow Measurement</td>
<td>MHRD, New Delhi</td>
<td>Ongoing</td>
</tr>
<tr>
<td>3</td>
<td>Design, analysis and optimization of navigation grade silicon based MEMS accelerometer</td>
<td>ISRO-KCSTC Cell</td>
<td>Ongoing</td>
</tr>
<tr>
<td>4</td>
<td>MEMS technology for micromechined silicon microsensor.</td>
<td>DRDO</td>
<td>2002 – 2007</td>
</tr>
<tr>
<td>5</td>
<td>Nanoscience and Technology – Mission oriented project</td>
<td>IIT Kharagpur</td>
<td>2003 – 2007</td>
</tr>
<tr>
<td>8</td>
<td>MEMS based micro-propulsion devices for micro-satellite programme</td>
<td>ISRO</td>
<td>2007 – 2010</td>
</tr>
<tr>
<td>9</td>
<td>Multi-scale modeling to study the role of atomic scale defects in CNT-based nanocomposites</td>
<td>DST, New Delhi</td>
<td>2007 – 2009</td>
</tr>
<tr>
<td>10</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</td>
<td>CSIR, New Delhi</td>
<td>2006 – 2009</td>
</tr>
</tbody>
</table>
11. Kinematics of flows in diverse contexts
   DST, New Delhi 2006 – 2009
12. Measuring the HI power spectrum with the GMRT
   BRNS, DAE, Mumbai 2007 – 2010
13. Targeted gene integration in rice and cotton
   ICAR, New Delhi On-going
14. Establishment of independence of Linkage Groups of jute through trisomic analysis in order to construct the genetical and physical map of jute genome.
   DBT, New Delhi On-going
15. Application of technology for tomato hybrid seed industry involving rural women for employment and income generation
   DST, New Delhi On-going
16. Recombinant DNA for development of a male-sterility system in jute.
   DBT, New Delhi On-going
17. Generation and cataloguing of bast fibre developmental stage specific EST library from jute
   DBT, New Delhi On-going
18. Design and fabrication of high sensitivity micro machined silicon tunneling accelerometer with micro-g resolution
   ISRO, Bangalore On-going

Consultancy Projects:

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Development of Fast Bipolar ASIC Chips</td>
<td>BARC, Mumbai</td>
<td>On-going</td>
</tr>
<tr>
<td>2</td>
<td>Development and realization of high Q-factor quartz double ended tuning forks using micromachining technology</td>
<td>ISRO-IISU</td>
<td>On-going</td>
</tr>
<tr>
<td>3</td>
<td>Development of ADC and Receiver for wireless applications</td>
<td>Si2 Microsystems</td>
<td>On-going</td>
</tr>
<tr>
<td>4</td>
<td>Design of RFIC modules</td>
<td>National Semiconductor Corporation, USA</td>
<td>On-going</td>
</tr>
</tbody>
</table>

VISITS ABROAD BY FACULTY MEMBER

1. Prof. S. Kal
   ITC-irst, Trento, Italy, May 2007
2. Prof. S. Kal
   University of Illinois at Urbana-Champaign, USA, June-July 2007
3. Prof. S. K. Ray
   Visiting Professor (Tokyo Institute of Technology) May–June 2007
3. Prof. S. K. Ray
   Visiting Professor (National University of Singapore) July 03, 2007
4. Dr. T. K. Bhattacharyya DST / JSPS Project work (University of Tokyo, Japan) 4 days

INVITED LECTURES BY FACULTY MEMBERS

1. Prof. S. Kal
   MEMS inertial sensors for Avonics and Space Applications, Workshop on MEMS and MICROSYSTEMS (May 28 – June 02, 2007) (IIT Kharagpur)

2. Prof. S. K. Ray
   Semiconductor Nanostructures (May 10, 2007 (Tokyo Institute of Technology)

3. Prof. S. K. Ray
   Ge nanostructures for electronic & optical devices (April 30, 2007) (CAT, Indore)

4. Prof. S. K. Ray
   Nanostructured Semiconductors, Recent Trends in Nanotechnology (April 29, 2007 (SGITS, Indore)

5. Prof. S. Das
   Quartz micromachining for MEMS applications, and Development of silicon microthruster for micro-satellite application, Workshop on MEMS and MICROSYSTEMS (May 28 – June 02, 2007) (IIT Kharagpur)

6. Dr. P. Gangopadhyay
   Lithium niobate integrated optics : modeling and experiments, Workshop on MEMS and MICROSYSTEMS (May 28 – June 02, 2007) (IIT Kharagpur)

7. Dr. P. Gangopadhyay and Prof. S. K. Lahiri
   LiNbO₃ integrated optics : modeling, simulation, and experiments, Workshop on Physics & Technology of All-Optical Communication Components and Devices, (October 11–16, 2007 (IIT Kharagpur)

8. Prof. S. K. Lahiri
   IOSIMM : A simulator for integrated-optic waveguides and components in OICs”, National Workshop on Advanced Optoelectronic Materials and Devices AOMD-2007 (BHU, Baranasi)

LECTURE BY VISITING EXPERT

1. Prof. Y. B. Gianchandani
   Microsystem research at Michigan University
   University of Michigan, Ann Arbor
   USA

BOOK PUBLISHED

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the Author(s)</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Prof. Sudebkumar P. Pal</td>
<td>Quantum Information,</td>
<td>Allied Publishers</td>
<td>2007</td>
</tr>
</tbody>
</table>
PATENTS GRANTED

1. A patent application on “The technology which leads to improved production of bast fibers using bacterial biofilm” is presently placed on the “Technologies Developed” Web-portal of IIT Kharagpur

LAURELS & DISTINCTIONS

1. Dr. P. Gangopadhyay Royal Society Incoming Fellowship to UK

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

1. QIP Workshop on MEMS and MICROSYSTEMS held at IIT Kharagpur campus May 28 – June 02, 2007

ADDITIONAL INFORMATION

Collaborative Efforts :

1. A joint collaboration research project on "Development of micromechanical inertial and flow sensors for environmental / biomedical application", sponsored by Department of Science & Technology, Government of India in going on under an Indo-Italian research programme (ITPAR). Collaborating Institute - ITC - irst. Trento, Italy
2. 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

Submitted Chips from Advanced VLSI Laboratory :

<table>
<thead>
<tr>
<th>Chip Code</th>
<th>Designers</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KGPIFS1</td>
<td>Debashis Mandal and Prof. T. K. Bhattacharyya</td>
<td>Integer N Frequency Synthesizer (Phase-II)</td>
</tr>
<tr>
<td>KGPIFS2</td>
<td>Debashis Mandal and Prof. T. K. Bhattacharyya</td>
<td>Integer N Frequency Synthesizer (Phase-III)</td>
</tr>
<tr>
<td>KGPHFOPAMP</td>
<td>Amal Kundu, Debashis Mandal and Prof. T. K. Bhattacharyya</td>
<td>UWB OPAMP (Phase-II), High capacitive load drive OPAMP</td>
</tr>
<tr>
<td>KGPLPRX</td>
<td>Ashudeb Dutta, Prabir Saha, Debashis Mandal and Prof. T. K. Bhattacharyya</td>
<td>1 Volt Radio receiver system</td>
</tr>
<tr>
<td>KGPQVCO</td>
<td>Prabir Saha and Prof. T. K. Bhattacharyya</td>
<td>IV Quadrature VCO</td>
</tr>
<tr>
<td>KGPHFSA</td>
<td>Ashis Maity and Prof. Amit Patra</td>
<td>High frequency Buck Converter</td>
</tr>
<tr>
<td>Project Code</td>
<td>Authors</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
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<td>------------------------------------------------</td>
</tr>
<tr>
<td>KGPHFSB</td>
<td>Ashis Maity and Prof. Amit Patra</td>
<td>High frequency Buck Converter</td>
</tr>
<tr>
<td>KGPHFSC</td>
<td>Ashis Maity and Prof. Amit Patra</td>
<td>High frequency Buck Converter</td>
</tr>
<tr>
<td>KGPEMC</td>
<td>Rupam Mukherjee and Prof. Soumitra Banerjee</td>
<td>Chaos Modulated Clock Generator, DC DC Converter</td>
</tr>
<tr>
<td>KGPADC07</td>
<td>Sounak Roy, Sanjay Kr. Dey, Santunu Sarkar, and Prof. Swapna Banerjee</td>
<td>Blocks of pipeline ADC</td>
</tr>
<tr>
<td>KGPLLQVI</td>
<td>Sourav Bannerjee and Prof. Pradip Mandal</td>
<td>Transimpedance amplifier &amp; Equalizer for opt. Fiber</td>
</tr>
<tr>
<td>ICPO15</td>
<td>Sougata Kr. Kar, S. Pandit and Prof. S. Sen</td>
<td>ASIC for capacitive accelerometer</td>
</tr>
<tr>
<td>ICPO16</td>
<td>Sougata Kr. Kar, S.Pandit and Prof. S. Sen</td>
<td>ASIC for capacitive accelerometer</td>
</tr>
<tr>
<td>KGPMEMS01</td>
<td>Sougata Kr. Kar and Prof. S. Sen Pradipta Patra and Prof. Amit Patra</td>
<td>ASIC for capacitive accelerometer Quad OPAMP</td>
</tr>
<tr>
<td>IPC020</td>
<td>Pradipta Patra and Prof. Amit Patra</td>
<td>Quad OPAMP</td>
</tr>
<tr>
<td>IPC023</td>
<td>Pradipta Patra and Prof. Amit Patra</td>
<td>Quad Comparator</td>
</tr>
<tr>
<td>KGPSIMO</td>
<td>Pradipta Patra and Prof. Amit Patra</td>
<td>Single inductor triple output buck converter</td>
</tr>
<tr>
<td>KGPIND1</td>
<td>Sharmistha Dey, Sushanta Mandal and Prof. T. K. Bhattacharyya</td>
<td>For measurement of inductor Characteristics</td>
</tr>
<tr>
<td>KGPOPAMP</td>
<td>Amal Kundu and Prof. T. K. Bhattacharyya</td>
<td>Test chip for differential OPAMP</td>
</tr>
<tr>
<td>UTKARSH2</td>
<td>Pawan Gupta and Prof. Amit Patra</td>
<td>Energy Based Boost Converter</td>
</tr>
</tbody>
</table>
HEAD: Professor Prabir Kumar Biswas

Officer:

Nanda, Dilip Kumar  M.Sc., DIIT, Ph.D. (IIT Kharagpur), Numerical Techniques, System Software
Goswami, Partha  B.Tech., M.Tech. (IIT Kharagpur), Networking
Singh, Pramod Kumar (on lien)  B.Tech., M.Tech. (IIT Kharagpur), Networking
Roy, Devshri  B.Tech., M.Tech., Ph.D. (IIT Kharagpur), Artificial Intelligence, DBMS
Das, Surid Kumar  B.Tech., M.Tech. (Rajasthan Vidyapith Deemed University), Hardware specialist, Networking
Chattopadhyay, A.  M.Sc. (Sagar University), Networking
Das, Sudipto  B.Tech., M.Tech. (Rajasthan Vidyapith Deemed University), Networking

FACILITIES

(i) Internet Facility

For Internet access and email access Internet Bandwidth (Terrestrial) services of 16 Mbps dedicated and 32 Mbps (1:4) shared terrestrial as well as 8 Mbps dedicated satellite link are available for the users to serve the heavy bandwidth demand at IIT Kharagpur. Two STM1 links with high bandwidth is being planned by the Institute which will be operational shortly. The Institute has two registered domains iitkgp.ernet.in and iitkgp.ac.in for Internet service redundancy. The Institute has its own public IP address blocks obtained from APNIC.

(ii) Network Facility

The Computer and Informatics center continues to perform as the centre of the institute network. The CIC administers and maintains this network. All the Departments / Centers / Schools are connected to this network by edge switches and are configured as separate VLAN’s. All the Halls of Residences are also connected to the Institute via a dedicated distribution switch and every room is provided with a data outlet.

(iii) Access from the Residential Campus

The faculty and staff members can use the Internet and Intranet facility from their residences through PPP (Point to Point Protocol) servers. The data transfer is through...
the IIT's telephone exchange so the data speed is restricted to the voice cable data rate. In addition, ADSL modems are also used in residences of the Institute campus to access the Internet facility.

(iv) Computational Facility

CIC has now added one more PC Laboratory to the two existing laboratories. This is in view of the increase in number of students as well to cater to more number of laboratories per week. All three laboratories are fully equipped with the latest teaching aids and a seating capacity of around 110 seats each. CIC also provided laboratories with smaller student strengths. The Centre also has a Terminal Server Room which can support about 40 terminals and are served by High End Servers. The Center’s Work Station Laboratory is also available for research scholars of the Institute. Servers available in the Centre are connected to the Institute LAN and the users can work from any corner of the academic campus. CIC also provides computational servers to the students with specific hardware and software requirement for their research.
CONTINUING EDUCATION CENTRE

DEAN : Professor Bani Chatterjee (01-04-2007 to 30-09-2007)  
Professor Ajay Chakrabarty (01-10-2007 till date)

FACILITIES

(a) Equipments

(i) High luminosity overhead projectors.
(ii) LCD Panel for multimedia projection.
(iii) 3M Multimedia Projector.
(iv) Shure cordless microphone and transmitter/receiver set.
(v) Ahuja tape recorder and public address system.

(b) Software

(i) Distance Education Database (from International Centre for Distant Learning)
(ii) KOMPASS Industrial Directory of India giving details of over 60,000 companies
(iii) Macromedia Authorware (4.0.6 licences)
(iv) Adobe Photoshop - graphics package
(v) Microsoft Front Page Express - for Web page development
(vi) Microsoft Office 2000 Professional
(vii) Microsoft Windows 2000 Professional
(viii) Microsoft Windows 2000 Server with terminal server facility
(x) ALGOR FEM package for stress fluid flow and electrostatic field analysis

PARTICULARS OF M.TECH AND PH.D SCHOLARS JOINED / COMPLETED :

(i) No. of Teachers completed Ph.D degree : 24
(ii) No. of Teachers completed M.Tech programme : 14
(iii) No. of Teachers joined Ph.D programme : 15
(iv) No.of Teachers taking advance admission to Ph.D programme : 21
(v) No. of Teachers joined M.Tech. programme : 14

CD CELL ACTIVITIES

(i) Manuscripts for text books completed : 1
(ii) No. of Text books approved : 5

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED
(i) QIP Short Term Courses : 10
(ii) Total No. of participants (QIP) : 297

1. Purvodaya : Ascent of the East (National Conclave)  
   April 07–08, 2007
2. Fabrication, repair & Installation of Non-Conventional 
   Rural Energy Devices  
3. Workshop on Filament Winding Technology  
   April 12–13, 2007
4. Early Software Reliability Prediction  
   April 18–20, 2007
5. Small Industries Management Programme (SIMAP)  
   April 23–27, 2007
6. Wireless Communications & Networks  
   May 14–19, 2007
7. Dechlorophyllation of Betel Leaves  
   May 21 – July 20, 2007
8. Computer Network Management  
   May 21 – June 12, 2007
9. MEMS And Microsystems  
   May 28 – June 02, 2007
10. Short Term Course on C++ & Java  
    May 28 – June 15, 2007
11. DSP Tools & Practice  
    June 04–09, 2007
12. Training Programme on Materials Management for 
    Probationary Officers of Indian Railway Stores 
    Services (IRSS)  
    June 11 – July 04, 2007
13. Computer Network Management  
    June 15 – July 09, 2007
14. Agro Service through Modern Agricultural 
    Technologies  
    June 18 – August 31, 2007
15. Advanced Training in Agricultural Engineering 
    (ATAE-07)  
    June 25 – July 15, 2007
16. Embded System & Technology  
    June 25–30, 2007
17. Reliability Aspects of Space Technology  
    July 02–07, 2007
18. Microwave & EMI Measurement  
    July 09–20, 2007
19. German Language (A Crash Course)  
    July 09–29, 2007
20. Effective Communication & Presentation Skills  
    July 15–19, 2007
21. Academic Program on Aircraft Engineering, Avionics 
    & Manufacturing Technology  
    July 19 – November 30, 2007
22. Decortication of Bahera  
    July 23 – September 22, 2007
23. Information Technology  
    July 27 – August 19, 2007
24. Oracle SQL & PL / SQL 10g  
    July 30 – August 14, 2007
25. Hazardous & Solid Waste Management  
    August 12–18, 2007
26. Stock Market, Investments and Derivatives  
    September 01–02, 2007
27. Mines Safety & Legislation  
    September 03–07, 2007
28. Modelling of Underwater Body Dynamic  
    September 08, 2007
29. Bioinformatics in Genomics and Proteomics  
    September 21–22, 2007
30. Dechlorophyllation of Betel Leaves  
    September 24 – November 11, 2007
31. Captive Plantation & Processing of Medicinal & 
    Aromatic Plants  
    September 24 – December 15, 2007
32. Workshop on Sustainability of Indian Aquaculture 
    Industry  
    September 28–29, 2007
33. Polymer Quest 2007  
    October 01–02, 2007
34. ’Practical Shipbuilding’ for newly recruited Officers  
    October 01–13, 2007
35. Supply Chain Management  
    October 03–07, 2007
36. A Short Term Course on Logic and Applications of 
    Logic  
    October 08–12, 2007
<table>
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<th>No.</th>
<th>Event Description</th>
<th>Dates</th>
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<td>37.</td>
<td>Physics &amp; Technology of All Optical Communication Components and Devices</td>
<td>October 11–16, 2007</td>
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<td>38.</td>
<td>GIS Applications</td>
<td>October 28 – November 04, 2007</td>
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<td>42.</td>
<td>Techniques of Hydrocarbon Exploration</td>
<td>November 19–24, 2007</td>
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<td>46.</td>
<td>VLSI Signal Processing</td>
<td>November 29 – December 04, 2007</td>
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<td>47.</td>
<td>Plant Layout Facility Planning</td>
<td>December 06–12, 2007</td>
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<td>48.</td>
<td>Workshop on Monitoring and Mitigation of Landslide Hazard in NE India</td>
<td>December 07, 2007</td>
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<td>49.</td>
<td>Orientation Course for DVC Engineers on Control and Instrumentation</td>
<td>December 10–14, 2007</td>
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<td>50.</td>
<td>Quantum Correlation and Quantum Computing</td>
<td>December 11–13, 2007</td>
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<td>51.</td>
<td>Cryogenic Air Separation</td>
<td>December 12–20, 2007</td>
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<td>52.</td>
<td>Modern Computer Architectures</td>
<td>December 14–16, 2007</td>
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<td>53.</td>
<td>Optical And Wireless Networks (OWN)</td>
<td>December 17–22, 2007</td>
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<td>54.</td>
<td>Technology CAD For VLSI Design</td>
<td>December 27–29, 2007</td>
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<td>57.</td>
<td>Operation &amp; Maintenance of Rural Tools Equipments and Power Machineries used in Agriculture Industry &amp; Services</td>
<td>January 07 – April 06, 2008</td>
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<tr>
<td>60.</td>
<td>International Workshop on “Biohydrogen Technology”</td>
<td>February 07–09, 2008</td>
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<td>64.</td>
<td>LAN &amp; Networking</td>
<td>February 22 – March 16, 2008</td>
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<tr>
<td>66.</td>
<td>Fabrication, Repairs &amp; Installation of Non-Conventional Rural &amp; Energy devices</td>
<td>March 03 – April 30, 2008</td>
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</tbody>
</table>
67. Organic Farming For Sustainable Agriculture  
   March 17–31, 2008
68. Training on “STATCOM & FPGA”  
   March 18–20, 2008
69. COMPOSIT – 2008  
   March 29–30, 2008
70. Industrial Safety Engineering  
   March 31 – June 20, 2008
Central Research Facility

Chairman: Professor Indranil Manna

Faculty Associated

- Prof. A. K. Das: Vice Chairman, Life Science Division
- Prof. Rahul Mitra: Vice Chairman, Materials Division
- Prof. A. Basak: In charge, CD Polarimeter
- Prof. M. Bhattacharjee: In charge, EPR
- Prof. S. K. Srivastava: In charge, ESCA
- Prof. S. K. Ghosh / Prof. T. K. Maiti: In charge, FACS
- Prof. I. Manna: In charge, FESEM, XRD, HRXRD
- 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
- Prof. S. Roy: In charge, Mass Spectrometer
- Prof. S. B. Singh: In charge, OES
- Prof. J. Dutta Majumder: In charge, Optical Microscopy
- Prof. P. K. Datta / Prof. P. Roy Chowdhury: In charge, Optical Fibre
- Prof. A. K. Ghosh: In charge, PCR, 2-D Gel. DNA Sequencer
- Prof. M. Chakraborty: In charge, SEM
- Prof. R. Mitra: 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

Senior Scientific Officer:

- Datta, Amal Kumar: Ph.D. (IIT Kharagpur), Experimental & theoretical condensed matter Physics.

Research and Development

Brief descriptions of on-going activities:

DNA sequencer; Real time Polymeric Cyclic Reaction (PCR) analyzer, 2-dimensional gel electrophoresis:

1. Sequencing DNA Samples provided by different investigators in automated DNA
2. Analyzing gene expression in different tissue sample by Real time PCR machine
3. Analyzing Protein samples by 2-D Gel electrophoresis system.

**FACS**: The instrument Fluorescence Activated Cell Shorter (FACS) is extensively used by the faculties and research scholars of Depart of Biotechnology and Medical Science & Technology, for cell cycle analysis, immune cell profiling, quantitation of various cytokines by bead array method.

**FE-SEM Lab**: This unit, purchased from a DST project under NSTI, has added a new dimension of microstructural analysis with nanometric resolution in bulk samples and surfaces without necessitating electron transparent thin foil preparation. This SEM is regularly used for microstructural studies of nano-structured materials, bulk alloys, thin films and powders (microstructure, micro-composition of phases, grain size, crystal and micro-defects in metallic, intermetallic, polymer and ceramic samples including composites. In addition, it is possible to carry out orientation imaging of crystallites by electron back scattered diffraction analysis. Beneficiaries include Departments of Biotechnology, Chemistry, Physics, Chemical Engineering, Cryogenic Engineering, Electronics and Electrical Communication Engineering, Electrical Engineering, Geology, Mechanical Engineering, Metallurgical and Materials Engineering, Materials Science Centre, Rubber Technology Centre, and many more. The external users include the other educational institutes, R&D laboratories and industries. A large number of publications, as well as Ph.D., M.Tech and B.Tech theses have come out with contributions from this FESEM.

**FTIR Lab**: FTIR analysis of different samples in powder, liquid and also film form in MID IR and FAR IR range, also some samples above ambient temperature is done by our institute students and faculties, also outside institute and industries.

**Hall Effect**: We have been investigating electronic-, magneto-transport and magnetic behavior of half-metallic highly spin polarized nanostructured colossal magnetoresistive (CMR) manganite magnetic oxides, doped CMR manganites, magnetic and optical properties of diluted magnetic semiconducting SPINTRONIC oxides ZnO:Mn/Ni/Fe/Co on (0001) Al₂O₃, Fe-rich soft ferromagnetic metallic glasses for low field GMI sensor applications, Nanostructured Ni-Zn, Co-Zn ferrites for high frequency sensor applications, Magnetic, electronic transport, Hall resistivity and anomalous Hall effect studies in epitaxial Ni nanoparticles embedded in metallic matrix, electronic transport, orbital ordering, magnetic anisotropy, magnetization behavior and effect of substrates structural transformation on 3-dimesinal lattice strain of epitaxially grown tensile and compressively strained 500 Å LCMO, LSMO CMR manganites films on single crystalline (001) BaTiO₃, SrTiO₃, LaAlO₃, NdGaO₃ and LaSrAlTiO₃ (001) substrates.

**HPLC**: The HPLC is equipped with Variable Wavelength Detector and Diode Array Detector which enables it to identify and quantify a wide range of biochemicals and various biomolecules such as peptides, proteins, sugars, phenolics etc. The available preparative columns (in addition to a wide range of nalyticalolumns) can be effectively employed for purification of compound for preparative purposes.

**HRTEM Lab**: The machine is routinely used for research on nano-structured materials, including bulk alloys, thin films and powders. In addition, it is used for identification and composition of phases, measurement of grain size, and to study line defects and stacking
faults in metallic, intermetallic and ceramic samples, as well as composites. In addition, it is possible to study phase transitions at low temperatures using the specimen holder operating at the liquid nitrogen temperature. The users of the HRTEM from IIT, Kharagpur include the students and faculty members of the departments of our institute include Biotechnology, Chemistry, Chemical Engineering, Cryogenic Engineering, Electronics and Electrical Communication Engineering, Electrical Engineering, Geology, Mechanical Engineering, Metallurgical and Materials Engineering, Materials Science Centre, Rubber Technology Centre, Physics, and so on. The external users include the other educational institutes, R&D laboratories and industries. The projects associated with the equipment are based on aluminium alloys, steels, composites, Biomaterials, Nanostructured materials, steel, intermetallics, Rubber and polymer based composites, Ceramic materials, Electronic Materials, etc. The laboratory has received and executed orders for study of a large number of samples from RDCIS, SAIL, Ranchi. A large number of publications, as well as Ph.D., M.Tech and B.Tech theses have come out with contributions from HRTEM laboratory.

**LC-MS/MS** : Isolation and characterisation of novel bioactive phytomedicinal compounds.

**MALDI-ToF** :
1. Biomarker identification of various bacteria using MALDI-ToF mass spectrometry
2. Crystal structure determination of proteins from pathogenic organisms.

**OES Lab** : Optical emission spectroscopy is used for chemical analysis of ferrous and non ferrous alloys within very short period (30 seconds). The samples analysed are predominantly, alloys used for research purpose in various Departments/Centres within IIT Kharagpur. Capability of the instrument in rapid simultaneous analysis of up to sixty elements fulfils the requirements of many facets of the metal industry, from production control to R&D or from incoming material inspection to scrap sorting.

**Optical Fiber Lab** : Photonic Crystal fiber design, fabrication and characterization for application as photonic components and devices.

**Scanning Electron Microscope (SEM) Lab** : The SEM laboratory is equipped with the JEOL JSM-5800 Scanning Microscope, OXFORD ISIS-300 EDS microanalytical system and DENTON VAC gold sputter coater unit. It is one of the most useful instruments for the people working with the surface and interface characterization of materials in particular. The students and faculties of various departments of the institute involved in materials research has been extensively used the instrument during last one year. The external users from various educational institutes, R&D laboratories and industries from different parts of the country, also have utilized the facility for their research work with satisfaction.

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.

**SPM Lab** : The Scanning Probe Microscopy (SPM) Lab is being used to analyze materials on a microscopic and nanoscopic scale to determine surface morphology, phase separation, etc. All kinds of materials, ranging from metals to semiconductors to polymers are studied here.
TEM and TEM Sample Preparation Lab: Work is in progress on pulsed Co-electrode position.

Thermal Analysis: Thermal analysis is one of the most basic characterization tool and is often used to study degradation of materials, reaction mechanisms and phase transformations in materials, etc. In our thermal analysis laboratory, we have one Differential Scanning Calorimeter (DSC), one Thermo-gravimetric and Differential Thermal Analyzer (TG-DTA) and one 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 nanocomposites, TG studies 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 aluminum based nano composites, etc. The TMA is being used to study the sintering behaviour of nano composite materials as well as to determine the thermal expansion coefficients of composite materials.

XRD LABORATORY: X-Pert Pro PW 3040/60 (High Resolution) and PW1710: The Philips PW1710 X-Ray diffractometer has provided continuous service to the internal (within IIT) and external users for diffraction analysis of metallic, ceramic and polymeric samples to identify the phases and their distribution, determine volume fraction of the phases, monitor phase transition and evaluation and evaluate normal residual stress, phase evaluation studies in nanocrystalline and amorphous products have yielded the most interesting series of results from the work carried out in this laboratory in the past one year.

The Panalytical X-Pert Pro PW 3040/60 High Resolution-I and High Resolution-II X-Ray diffractometer has also provided continuous service to the internal (within IIT) and external users. Normal phase analysis with X'Celerator, monitor phase transition and evaluation and evaluate normal residual stress, Texture, Thinfilm (GIXRD) and Phase transformation at High Temperature, phase evaluation studies in nanocrystalline and amorphous products have yielded the most interesting series of results from the work carried out in this laboratory in the past one year.

Thrust Areas:

1. Microstructural and micro-compositional analysis
2. Molecular Biophysics and Biotechnology
3. Silica optical fiber preform and drawing
4. Nanoparticles and composites, Nanostructured Materials
5. Bioprospecting (LC-MS/MS)
6. Identification and quantification of different biomolecules such as peptides, carbohydrates, phenolics and vitamins.
7. (Hall Effect) SPINTRONICS, CMR, TMR, GMR Nanostructured highly spin polarized Magnetic oxides, Nanostructured Ni-Zn, Co-Zn Ferrites, Nanostructured Fe-rich soft ferromagnets for Giant Magneto-impedance low magnetic field sensor applications.

New Acquisitions:

1. MALDI: Protein crystallography facility
ADDiTiOnAL INFORMATiON

Consultancy Projects:

**XRD Lab.** : Consultancy work from several industries, universities and research organizations like Vidyasagar University; Department of Central Mechanical Engineering Research Institute (CMERI), Durgapur, Central Institute of Plastics Engineering and Technology (CIPET), Bhubaneswar, Utkal University, Visvabharati University, Shantiniketan and was undertaken by the XRD Lab, CRF, IIT Kharagpur.

**Service Rendered to Other Organizations:**

**HRTEM** : SAIL R&D, IACS Kolkata, VSSC Trivandrum, SN Bose Institute Kolkata, IIT Guwahati, IIT Kanpur, BESU Shibpur, Jadavpur University Kolkata, Vidyasagar University, etc.

**SEM** : IIT Roorkee, IACS Calcutta, ISM Dhanbad, NML Jamshedpur, BIT Meshra, NIT Durgapur, Vidyasagar university, Ravenshaw college and Cochin university of science and Technology.
CENTRAL LIBRARY

CHAIRMAN : Professor Sadananda Sahu

Librarian

Sutradhar, B. Ph.D., M.Sc., M.L.I.Sc., CCA

Deputy Librarian :

Ratnasamy, M. M.L.I.Sc., PGDCA
Pusty, J. N. M.L.I.Sc, M.Com.

Assistant Librarian :

Shankar, Uma M.L.I.Sc., M.A.
Mohapatra, P. K. M.L.I.Sc, M.A.
Nandi, Atin M.L.I.Sc, M.Sc., DCO

APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Appointment :

Dr. B. Sutradhar Librarian
Mr. J. N. Pusty Deputy Librarian
Mr. P. K. Mohapatra Assistant Librarian
Mr. A. Nandi Assistant Librarian

Retirement :

Mr. M. G. Mandal Senior Library and Information Officer

Resignation :

Mr. Shri V. K. Jagajeevan Assistant Librarian

The Central Library is one of the biggest technical libraries in Asia and its web site address is http://www.library.iitkgp.ernet.in

DOCUMENT COLLECTIONS :
The Central Library acquired 1369 general books and 1915 text books. It also added 2878 bound volumes of periodicals, besides reprints and annual reports of other universities. The Library subscribes 1054 journals and provides access to over 10000 online full-text journals.

**CIRCULATION :**

The books circulation activities are fully automated and serve the users consisting of the faculty, research scholars, students and staff. The books circulation service is kept open for 50 hours a week. On the average, the monthly circulation transactions are about 9917. About 39 copies of documents were obtained through Inter-Library Loan.

**DIGITAL LIBRARY :**

The Digital Library is Kept open for about 14 hours a day and provides access to the following databases:


It also provides access to Video-Courses which contains the lectures delivered by out faculty members. Twice a week the Digital Library organizes User Education Programme so as to train the students to use our digital resources effectively.

**INDEST – AICTE Consortium Databases :**

The Central Library IIT, Kharagpur is a member of the INDEST Consortium. INDEST membership facilitates the users to access the full text of about 6500 online journals which also include the following: Full Text Databases: a) IEL (IEEE & IEE Electronic Library); b) Elsevier Science Direct; c) Springer Verlag Link; d) ACM Digital Library; e) Proquest’s ASTP; and f) ABI/INFORM. Abstracting Databases: a) SciFinder Scholar; b) Compendex; c) INSPEC; d) J-Gate; e) Web of Science; f)MathSciNet etc.

Central Library, IIT Kharagpur has setup an Institutional Repository using open source software ‘D-Space’. At present the Institutional Repository has 1000 articles, several question papers, books and theses.

**INVITED LECTURES**

1. Dr. B. Sutradhar  
   Invited lecture delivered on “Digital Library Preservation”, Sixth Refresher Course of Dynamic Role of Academic Libraries in Digital Era organized by Department of Library and Information Science, University of Calcutta, September, 6-26, 2007
2. Dr. B. Sutradhar  

BOOK PUBLISHED

<table>
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<tr>
<th>#</th>
<th>Name of the Author(s)</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
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<tbody>
<tr>
<td>1.</td>
<td>Dr. S. K. Pathak</td>
<td>An evaluation of Central Library, IIT Kharagpur. Contribution to the book &quot;The successful university library in a developing county&quot;</td>
<td>Main Library, The University of the West Indies, St. Augustine Campus, St. Augustine, Trinidad and Tobago, West Indies.</td>
<td>2008</td>
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PARTICIPATION IN CONFERENCE / WORKSHOPS

Dr. B. Sutradhar participated Fifth Annual Workshop and Meet of INDEST-AICTE Consortium organized by Indian Institute of Technology Roorkee during December 27-28, 2007


AWARD

B. Sutradhar, Librarian at Central Library, has been awarded the Ph.D. degree in Library and Information Science by the Vidyasagar University on 20th July 2007 for his thesis entitled “Electronic Information Sources, Services and the possibility of Networking for Resources Sharing in the Libraries of the Indian Institute of Technology : An Evaluation”.

S. K. Pathak, Assistant Librarian at Central Library, has been awarded the Ph.D. degree in Library and Information Science by the University of Pune, Pune on 06th December 2007 for his thesis entitled “Use of Electronic Journals in Astronomy and Astrophysics Libraries in India”.

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 postgraduate and research activity in the Institute.

It is one of the major service sections of the Institute having following units:

1. Mechanical
2. Carpentry
3. Electronics
4. Audio Visual

Apart from executing Work Orders from various Departments / Centers / Sections of the Institute, CWISS also undertakes work orders from outside on cost basis.

(1) MECHANICAL SECTION

Mechanical Section in CWISS comprises Mechanical Fabrication, Mechanical Instrument and Glass Blowing Section.

(a) Mechanical Fabrication Section

It is equipped with various types of machines like CNC Lathe, 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 and Pantograph Machine, Power Saw, Shearing Machine, Polishing, Bobbing, Press, Arc Welding, Brazing and Soldering, etc.

A new CNC Engraving Machine and CNC Milling Machine are the new addition during the current year which have added a new machining capability to the section.

The Mechanical Fabrication Section caters the service to almost all the departments in IIT for any type of precision and complicated mechanical fabrication or repair with various types of metals.

Last year the Mechanical Section has performed jobs of about 120 work orders comprising of –
i) Fabrication of different types of Wave Guides  
ii). Fabrication of Film Extruder  
iii) Fabrication of Target holder  
iv) Fabrication of Die-Punches of different sizes  
v) Fabrication of different sizes tensile, Charpy specimens of different materials  
vi) Fabrication of sample holder for wear test  
vii) Fabrication of Flanges, Studs, etc.  
viii) Fabrication of Rack, Pinion & Gears  
ine) Fabrication of Sample for, XRD, X-ray, SEM, test  
x) Fabrication of different attachment for leaser operation  
xi) Fabrication of Micro-channel  
xii) Fabrication of air pollution measuring device  
xiii) Fabrication of Mould with different materials  
xiv) Fabrication of Die-Punch  
xv) Fabrication of Fixture arrangement for wear test  
xvi) Fabrication of powder feed arrangement  
xvii) Fabrication of CBM set-up  
xviii) Fabrication of LVDI holder  
ix) Fabrication of Low volume Aerosol sampler.

(b) **Mechanical Instruments Section**

Different types of precision mechanical instruments are repaired in this section. Some typical examples include different types of stopwatches, gauges, valve regulators, balances, vacuum pumps, gear pumps, husk cutter, water flow meter, gas flow meter, dial indicator, dial gauge, micrometer, gas regulator, pressure gauge, autoclave, viscometer, various types of equipments and machines used in our Hospital, etc. Fabrication of sample holders of SEM & XRD, fabrication of very precision items etc.

(c) **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 and LPG for Departments, like Chemistry, Biotechnology, Chemical, Cryogenic, Mechanical, Materials Science, Metallurgical Engineering, Agricultural & Food Engineering & 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. This year this Section has finished about 129 work orders.

(2) **CARPENTRY SECTION**

Housed in the workshop complex behind Chemical Engineering & Automobile Section, this Section has Auto Planner, Joints Nature’s machinery, Vertical Band Saw
and Multipurpose Machine. Apart from carpentry jobs, it does undertake construction of Frames, Hand painting, Spray painting, Polishing of leather writing of name plates, display board & upholstery jobs as students’ projects, model for students, Arena etc.

This Section also meets the major requirements of furniture of the Institute. During the year 2007-2008, this section has completed 148 work orders.

Details of some of the work done during period:

i) Faculty Table ... 21 Nos.
ii) Office Table ... 03 Nos.
iii) Computer Table ... 17 Nos.
iv) Laboratory Table ... 22 Nos.
v) Working Table ... 12 Nos.
vi) Book Shelf ... 08 Nos.
vii) Sign Board ... 19 Nos.
viii) Wall case ... 04 Nos.
ix) Model for Students ... 04 Nos.
x) Notice / Key Board ... 07 Nos.
xii) Stool / Bench ... 27 Nos.
xii) Box as per design / Packing ... 09 Nos.
xiii) Wooden blocks ... 30 Nos.
xiv) Name & No. Plate & Writing ... 105 Nos.
xv) Repair of old Table & Chair ... 10 Nos.
xvi) Models for Kshitij

(3) ELECTRONICS SECTION

In present day machines electronics plays a major role. Apart from conventional electronics equipments like Oscilloscopes, Signal generator, DC Power supply units, UPS and so on, these are various other machines where electronic control and measurement form an integral part of such machines. Electronics Section gives post warranty service to such machines and equipments spread over almost all departments. The section also has facility for design and fabrication of double sided PCBs using LPKF PCB Prototyping machine.

A list of some of the equipments that were repaired by this section are

i) DC Power Supply Unit Materials Science, Physics & Meteorology, Cryogenic Engineering, Central Research Facility, Biotechnology
ii) Lock-in-Amplifier Physics & Meteorology
iii) Weighing Machine Mining Engineering
iv) Strain Indicators Civil Engineering
v) U. S. Therapy Machine B. C. Roy Technology Hospital
vi) Centrifuge Biotechnology
vii) P. H. Meter Biotechnology
viii) Hotair Oven / Mantle Geology & Geophysics
ix) E. D. M. Machine  Mechanical Engineering
x) Shear Indicator  Civil Engineering
xi) Stabilizer  Materials Science, Cryogenic Engineering, Mining Engineering, Electronics Electrical Communication Engineering

xii) Standardization of Adom 4011 card  Cryogenic Engineering
xiii) Diamond cutter instrument  Metallurgical & Materials Engineering
xiv) MKS Controller  Central Research Facility
xv) Magnetic Stirrer  Chemistry
xvi) Cooling bath  Chemistry
xvii) Relay Controller & pressure switch  Chemistry
xviii) Amplifiers (4 channel, 2 Channel)  Civil Engineering
xix) Oscilloscopes  Materials Science
xx) Potentiostat Galvanostat with pulsed supply  Metallurgical & Materials Engineering
xxi) Rotary evaporator  Chemistry
xxii) Slow strain rate testing machine  Metallurgical & Materials Engineering
xxiii) Laser beam  Chemical Engineering
xxiv) Resistivity bridge  Metallurgical & Materials Engineering
xxv) Programmable current source  Materials Science
xxvi) Lamination machine  Academic Section
xxvii) 805 Controllers  Cryogenic Engineering
xxviii) Temperature indicator  Agricultural & Food Engineering, Chemical Engineering
xxix) Furnaces  Metallurgical & Materials Engineering
xxx) Chart recorder  Metallurgical & Materials Engineering
xxxi) ND-YAG Laser  Mechanical Engineering

L.P.K.F. M/C Usage

Electronics & Electrical Communication Engineering  -  19
Electrical Engineering  -  13
G. S. Sanyal School of Telecommunications  -  08
Computer Science & Engineering  -  03
School of Medical Science & Technology  -  01
Total Job  =  44

(4) Audio Visual Section

Audio Visual Section provides most modern audio visual support for conducting regular classes (approximately 160 classes per week) at different lecture halls.

It also provides support to various student activities like Quiz, Plays, Spring Festival, Kshitij, Inter Hall competitions and Training & Placement activities. It also helps in
conducting other academic activities like Convocation, Senate Meeting, JEE, GATE, etc. as well as various Seminars, Conferences and Workshops organized by the Institute.

The audio visual equipments that are used include Multimedia Projector, Over Head Projector, Document Cameras, High quality Amplifiers and Mixtures, Wireless Microphones, Noise Suppressors and Conference Systems.
The Centre for Theoretical Studies (CTS) at the Indian Institute of Technology Kharagpur (IIT Kharagpur) 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 Kharagpur 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 Kharagpur and graduate students from within and outside IIT Kharagpur) 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 inter-disciplinary theoretical research as a major goal, tapping the diversity available in the academic population of an Institute like IIT Kharagpur.

AIMS & OBJECTIVES

1. To generate and nucleate theoretical research
2. To organize seminars on diverse topics
3. To organize Conferences/Workshops
4. To provide research facilities to students/faculties from within and outside IIT Kharagpur
5. To offer postgraduate level elective courses

FACILITIES

i) A Computer Lab with 11 Pentiums, 2 Quad core server and Linux Cluster from CDC
ii) HP Laser printer, HP Laserjet duplex network printer, HP Colour Deskjet Printers, Scanner
iii) DAT Drive (24 GB)
iv) Software (Mathematica, Matlab, Maple, Scilab, IDL etc.)
v) CTS library
vi) Visitor's Hall for the Visitors Visiting the Institute under CTS Visitors Programme

COLLABORATIVE EFFORTS

The Center for Theoretical Studies has very active collaborative research programmes in the broad 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.

RESEARCH AND DEVELOPMENT
Brief descriptions of on-going activities:

Research is carried out on the following areas:

1. **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

2. **Dynamics and control**
   i) Nonlinear dynamics : Bifurcation Theory and Chaos
   ii) Control theory
   iii) Vibrations

3. **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

4. **Theoretical Condensed Matter Physics**
   i) Computational Condensed Matter and Statistical Physics
   ii) Superconductivity

5. **Theoretical Chemistry**
   i) Large scale simulations of complex systems
   ii) Density functional theory, quantum chaos

**Thrust Areas:**

1. Astrophysics, Cosmology & Relativity
2. Nonlinear Sciences
3. Mathematics, Mathematical physics and Theoretical Computer Science
4. Theoretical Condensed matter Physics
5. Theoretical Chemistry

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects:**

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</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</td>
<td>CSIR, New Delhi</td>
<td>2006 – 2009</td>
</tr>
</tbody>
</table>
3. Measuring the HI power spectrum with the GMRT BRNS, DAE, Mumbai 2007 – 2010

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.

Visitors during 2007–2008 :

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the visitor</th>
<th>Institute / University</th>
<th>Associated Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dr. Supratik Pal</td>
<td>Ph.D., Jadavpur University</td>
<td>Dr. S. Kar Department of Physics &amp; Meteorology</td>
</tr>
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<tr>
<td>2.</td>
<td>Dr. Motahar Reza</td>
<td>Sr. Lecturer, National Institute of Science and Technology, Berhampur</td>
<td>Dr. S. Chakraborty Department of Mechanical Engineering</td>
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<tr>
<td>3.</td>
<td>Dr. Saibal Roy</td>
<td>Lecturer, Barasat Government College, Kolkata</td>
<td>Dr. S. Bharadwaj Department of Physics &amp; Meteorology</td>
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<tr>
<td>4.</td>
<td>Dr. M. A. Neelakantan</td>
<td>Assistant Professor, Department of Chemistry, NEC, TN</td>
<td>Prof. P. K. Chattaraj Department of Chemistry</td>
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<tr>
<td>5.</td>
<td>Dr. Santanu Chattopadhyay</td>
<td>Reader in Physics, J. K. College, Purulia</td>
<td>Prof. S. Banerjee Department of Electrical Engineering</td>
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<tr>
<td>6.</td>
<td>Dr. Pankaj Kumar Mishra</td>
<td>Ph.D., IIT, Kanpur</td>
<td>Dr. S. Bharadwaj Department of Physics &amp; Meteorology</td>
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<tr>
<td>7.</td>
<td>Mr. Saswata Shannigrahi</td>
<td>Ph.D., Student, TIFR</td>
<td>Prof. S. P. Pal Department of Computer Science &amp; Engineering</td>
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<tr>
<td>8.</td>
<td>Dr. Bhag Chand Chauhan</td>
<td>Department of Physics, Government College, Karsog, H.P</td>
<td>Prof. P. K. Raina Department of Physics &amp; Meteorology</td>
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<tr>
<td>9.</td>
<td>Dr. Sujit kumar Bose</td>
<td>Professor [Retired], SNBNCBS, Kolkata</td>
<td>Prof. S. Dey Department of Civil Engineering</td>
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<tr>
<td>10.</td>
<td>Dr. Biswajit Pandey</td>
<td>Post Doc., IUCAA, Pune</td>
<td>Dr. S. Bharadwaj Department of Physics &amp; Meteorology</td>
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<tr>
<td>11.</td>
<td>Dr. Nilakantha Nayak</td>
<td>SNBNCBS, Kolkata</td>
<td>Prof. N. Chandra Department of Physics &amp; Meteorology</td>
</tr>
<tr>
<td>No.</td>
<td>Faculty Member</td>
<td>Lectures/Workshops</td>
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</tr>
<tr>
<td>1.</td>
<td>Dr. S. Bandyopadhyay</td>
<td>Indo-German Conference on “Modeling Chemical and Biological Reactivity”, Indian Institute of Chemical Technology, Hyderabad, India</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Dr. S. Bandyopadhyay</td>
<td>Workshop on “Structure and Dynamics of Biomolecules 2007”, S. N. Bose National Centre for Basic Sciences, Kolkata, India</td>
<td></td>
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<tr>
<td>6.</td>
<td>Prof. P. K. Chattaraj</td>
<td>“Quantum Trajectory”, Indo-German Conference on “Modeling Chemical and Biological (Re)activity”, IICT, Hyderabad, September, 2007 (Member, Scientific Advisort Committee)</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Prof. P. K. Chattaraj</td>
<td>“Quantum Trajectory”, International Conference on “Recent Developments in Non-linear Dynamics”, School of Physics, Bharathidasan University, Tiruchirapalli, February 2008</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Prof. S. P. Pal</td>
<td>“Combinatorial methods for studying LOCC incomparability”, International School and Conference on “Quantum Information (ISCQI)”, Institute of Physics, Bhubaneswar,</td>
<td></td>
</tr>
</tbody>
</table>
LECTURE BY VISITING EXPERT

1. Professor Govind Swarup  
   National Centre for Radio  
   Astrophysics, TIFR, India  
   Radiowaves and the Universe Key questions today; GMRT and SKA  
   (S. Datta Majumdar Memorial Lecture)
2. D. Nandrekar, M Bhasin and T. Agrawal, IUCAA, Pune  
   Demonstrations on Virtual Observatories
3. Prof. R. Banerjee  
   S. N. Bose Centre, Kolkata  
   Hawking radiation and anomalies II
4. Prof. A. N. Sekar Iyenger  
   SINP, Kolkata  
   Nonlinear Dynamics Experiments in Plasma
5. Dr. Anindya Chatterjee  
   Mechanical Engineering  
   IISc, Bangalore  
   Sub-exponential attenuation of waves in a periodic structure
6. Dr. S. Mazumder  
   Solid State Physics Division, BARC, Trombay, Mumbai  
   The phenomenon of dynamical scaling of structure factor
7. Mr. Kaushik Mitra  
   Department of Physics  
   University of Maryland, USA  
   Bosons and fermions in harmonically trapped optical lattices
8. Prof. B. C. Chauhan  
   Government College  
   Karsog, Mandi (HP)  
   Solar Neutrinos: Oscillations and Flux variations
9. Dr. N. Nayak  
   SNBNCBS, Kolkata  
   Spin squeezing and entanglement
10. Prof. Jozef Gruska  
    Faculty of Informatics  
    Masaryk University, Brno  
    Czech Republic  
    INFORMATICS as a FUNDAMENTAL SCIENCE and its relation to physics and mathematics
11. Prof. S. N. Behera  
    Ex-Director, IOP, Bhubaneswar  
    Fifty years of the publication of BCS Theory of Superconductivity

BOOK PUBLISHED

<table>
<thead>
<tr>
<th>#</th>
<th>Name of the Author(s)</th>
<th>Title</th>
<th>Publisher</th>
<th>Year</th>
</tr>
</thead>
</table>
LAURELS & DISTINCTIONS

1. Dr. S. Kar
   Member, Editorial Board, Indian Journal of Physics
2. Prof. P. K. Chattaraj
   Member, Editorial Board: Journal of Chemical Sciences, Bangalore, Published by Indian Academy of Science (2007)
3. Prof. P. K. Chattaraj
   Member, Editorial Board: Journal of Assam Science Society, Assam, Published by The Assam Science Society (2007)
4. Prof. P. K. Chattaraj
5. Prof. P. K. Chattaraj
   Member, Editorial Board: Journal of Molecular Structure: THEOCHEM, Published by Elsevier Science (2008)
6. Prof. P. K. Chattaraj
   Fellow of the Indian National Science Academy, New Delhi, 2008
7. Prof. P. K. Chattaraj
   Council Member, Chemical Research Society of India, 2008
8. Prof. Soumitro Banerjee
   Fellow of the Indian National Science Academy, New Delhi, 2008

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

INFORMATION CELL

PROFESSOR-IN-CHARGE : Professor 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 fully renovated the web sites of the Institute, Online Notice-Board and of the Global Alumni Network. 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 published information books like Communication Directory, Planner, Staff Directory and Pocket Guide. The Cell participated in preparation of Press Releases and Institute Information Notes as and when required from time to time.

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 the Technology Students Gymkhana. 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 filing of complaints.

In a major development work being carried out in the Cell, distributed academic databases of the Institute are going to be linked to create a one-point information access system. It will make easy availability of information as well as provide a strong decision making support to the Institute.
INSTITUTE CIVIL WORKS

CHAIRMAN : Professor Sriman Kumar Bhattacharyya

Officer :

Mukherjee, T. K.  Superintending Engineer
Roy, Subrata  Executive Engineer
Rai, B. B.  Engineer
Murugananthan, N.  Engineer

Considering the increase in the student strength, the Institute has taken several new initiatives to augment its infrastructural facilities in terms of students’ hostel, class rooms, apartments for faculty and staff members, laboratory complex etc.

Construction of 250 capacity hostel for girls named “Rani Laxmibai Hall of Residence” has been completed and put to service. The capacity of Mother Teresa Hall of Residence has been augmented. Initiatives have been taken to augment the capacity of students hostel by adding an additional floor on the existing ones or by adding an additional block.

Construction of 144 numbers “A” and “B” type apartments for faculty is under progress. Arrangements are made to start the construction of 2 nos. 2000 capacity students’ hostel, a dedicated laboratory complex for first year students, chemical science block, class room and tutorial room complex. Arrangements have also been made to start the construction of apartments for staff members.

CPWD is presently carrying out many projects for IIT Kharagpur out of which, new 120 Room Guest House is in the advanced stage of completion. Expansion of academic buildings by CPWD will also start very soon.

Construction of Rajiv Gandhi School of Intellectual Property Law (RGSOIPL) is in the advanced stage of completion.
INSTITUTE ELECTRICAL WORKS

PROFESSOR-IN-CHARGE : Professor Sabyasachi SenGupta

Officer :

- Ghosh, Sabyasachi Executive Engineer (Electrical)
- Kumar, Mahesh Executive Engineer (Electrical)
- Chakrabarty, Dipak Kumar Executive Engineer (Electrical)

The overall load in the Institute & residential area is increasing rapidly. The multilevel class rooms, faculty apartments, the undergraduate laboratory complex and many new boys hostels are coming up in a short span of time. The students' strength is also expected to rise to around 15000 and the total population of the campus is to rise proportionately.

To cater to the above requirements the following measures have been taken:

1. Augmentation of the main receiving Substation from 11 MVA to 14.3 MVA.
2. Augmentation of all distribution Substations to double their earlier capacities.
3. Strengthening of the distribution system with underground cables.
4. Intelligent energy monitoring system from substation to the various departments for the purpose of energy audit.
5. Installation of capacitor banks and STATCOM devices in the substations for power factor and power quality improvement.
7. Upgrading electrical panels in most of the academic departments.
To meet the additional water demand from the increased student and faculty strength, Water Works Section of the Institute has taken up several new water related works. They are in different stages of progress.

**Works completed:**

The following works have been just completed:

1. Construction of three riverbank deep tubewells at Anicut Pumphouse;
2. Drilling of a new deep tubewell at at Rani Laxmibai Hall of Residence;
3. Providing kitchen sink at Bachelor Flat Quarters.

**On-going works:**

The following new projects are being implemented:

1. Consultancy services for alternate water sources for IIT Kharagpur;
2. Installation of flow meter at water sources;
3. Construction of iron removal plants for deepwell of hall area.

**Works in the pipe line:**

1. Providing additional water tanks at various halls.
CHAIRMAN: Professor Somnath Sengupta

FACULTY

Professor:

Sengupta, Somnath  Ph.D., Image & Video Processing
Sarkar, B. K.  Ph.D., RF & Microwave Engineering
Chakrabarty, Ajay  Ph.D., Microwave circuits & Antennas & EMI / EMC
Sen, S.  Ph.D., MEMS
Patra, Amit  Ph.D., Power System & VLSI Design
Das, S. K.  Ph.D., Control System
Rajakumar, R. V.  Ph.D., Communication & Signal Processing
Sanyal, S.  Ph.D., RF & Microwave Engineering
Chakraborti, S.  Ph.D., Communication
Biswa, P. K.  Ph.D., Image Processing
Bandyopadhyay, S. S.  Ph.D., Cryogenic Engineering
Chowdhury, K.  Ph.D., Cryogenic Engineering

Assistant Professor:

Saha, G.  Ph.D., Communication
Sinha, M.  Ph.D., Aerospace Engineering
Mukhopadhyay, S.  Ph.D., Video Image & Processing
Bhattacharya, A.  Ph.D., RF & Microwave Engineering
Das, S.  Ph.D., MEMS & Microsystems
Chakraborty, P. K.  Ph.D., Solid-state Science and Technology
Ghosh, B.  Ph.D., RF MEMS
Bhattacharya, T. K.  Ph.D., RF & Microwave Engineering

Visiting / Adjunct Faculty:

Bose, A.  M.E., Mechanical Engineering
Dasgupta, S.  Ph.D., Control System
Das, B. B.  Ph.D., Control System

Emeritus Professor:

Naryanan, K. G.  Ph.D., Microwave Engineering

Chair Professor:

Sarkar, B. K.  Ph.D., RF & Microwave Engineering

Officer:
Sahoo, G. Ph.D., EMI / EMC, Microwave, Waveguide Slot Antenna and Mining Electronics
Guchhait, P. K. M.Tech., Polymers Science & Engineering
Ghosh, Saswati Ph.D., EMI / EMC, RF Microwave Circuit & Antenna

FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

Faculty Appointed as Emeritus Professor:

Dr. K. G. Narayanan Professor

Faculty Retirement:

Prof. S. L. Maskara Professor
Prof. S. K. Lahiri Professor
Prof. T. S. Lamba Professor

RESEARCH AND DEVELOPMENT

Brief descriptions 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 the 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

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 of CIF frams size (352×288 pixels) at 30 frames/sec.

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 measure even in the most 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 techniques like STD needs to be developed for this purpose. This has been the field of study for the present investigator.

Monopulse Comparator:

Design of highly compact comparator for monopulse radar application using reduced height Ku-band waveguided.

DRA
Design, Simulation and fabrication of CPW feed DRA ton the narrow band application.

IRA
Impulse Radiating Antenna. Design Simulation and fabrication of USB IRSA.

MPCA
Miniatuerized Printed Circuit Antenna Design, Simulation and fabrication, Testing of Antenna for different Applications like Mobile, UMTS, etc.

RFID
Radio frequency Identification - Design Implementation of Tracking Algorithm and the simulation of the Antenna.

MTMs
Gain Enhancement of eclectically small antennas using Metamaterials:- Design and
Simulation of an electrically small antenna surrounded by Metamaterial shell / sphere.

MOM

Method of Moment (MOM) analysis, design, fabrication and testing of various types of waveguide slot excited Dielectric resonator Antennas (DRAs).

Electromagnetic Modeling 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 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.

GPS

Global positioning system (GPS), Adaptive Equalizer, Adaptive Array Antenna (Smart Antenna), Digital Signal Processing, Microwave Communication, Image processing & Numerical Techniques in Electromagnetic.

Thrust Areas :

1) Micromachining (MEMS)
2) Cryogenics
3) Propulsion and Engines
4) EMI / EMC
5) Sensors
6) RF and Microwave Planar Circuits
7) Materials
8) Digital Communication
9) Embedded Software Solutions
10) Antennas
11) Control Systems
12) Microelectronics
13) IP–Core Design

New Acquisitions :

1. CST Software – Microwave studio, version –5.
2. IE3D - version – 9 by Zeland Software Inc.
3. WIPL-D
4. HFSS
5. VCO – Model no – ZOS – 1025, Freq. Range-685-1025MHz
6. LNA :-
   i) Model-ZEL – 0812 LM, Freq. Range- 800-1200 MHz
ii) Model – ZHL-0812 HLN, Freq. Range-800-1200MHz
iii) Model – ZHL-2HAD, Freq. Range-50-1000 MHz
iv) Model- ZFL – 1000VH2, Freq. Range- 10-1000MHz

7. Filters :-
i) LOW PASS FILTER:- Model.no – BLP – 550, Freq. Range – DC-520
ii) HIGH PASS FILTER:- Model.no – NHP-1000, Freq. Range-DC-550

8. Mixers :-
i) Model.No-ZLW – 2, Freq. Range- 685-1025MHz
ii) Model.no- ZEM-4300, Freq. Range-300-4300MHz

ON-GOING RESEARCH PROJECTS

Sponsored Projects :

<table>
<thead>
<tr>
<th>#</th>
<th>Title of the Project</th>
<th>Sponsor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Electromagnetic Modeling of High Frequency Electronic Systems to Estimate Electromagnetic Compatiblity</td>
<td>DST, New Delhi</td>
</tr>
<tr>
<td>2</td>
<td>Development of Specific Software Modules for Realising Monopulse Slotted Array Antenna Using Non-Standard Wave guide at Ku-Band Along Sensitivity Analysis</td>
<td>RCI, Hyderabad</td>
</tr>
<tr>
<td>3</td>
<td>Feasibility Study of Anti-Jam GPS Receiver for GPS Guided Weapons</td>
<td>ARMREB, New Delhi</td>
</tr>
<tr>
<td>4</td>
<td>FPGA – based design and development of H-264 Codec</td>
<td>ISRO- IIT Kharagpur Cell</td>
</tr>
<tr>
<td>5</td>
<td>Development of RF MEMS Capacitive Shunt Switch in Application as Phase Shifters for Satellite Communication System</td>
<td>ISRO- IIT Kharagpur Cell</td>
</tr>
<tr>
<td>6</td>
<td>Feasibility Study of Microwave Imaging for Material Resource Exploitation in Planetary Mission</td>
<td>ISRO- IIT Kharagpur Cell</td>
</tr>
<tr>
<td>7</td>
<td>Contoured beam synthesis for array antenna to obtain efficient footprint pattern with gain optimization</td>
<td>ISRO- IIT Kharagpur Cell</td>
</tr>
<tr>
<td>8</td>
<td>Feasibility Study of Compact Foldable Type Trans / Receive Antenna Design in 2-3GHz Band</td>
<td>ISRO- IIT Kharagpur Cell</td>
</tr>
<tr>
<td>9</td>
<td>Development of Algorithm for Adaptive Antenna Array for Satellite Communication</td>
<td>ISRO- IIT Kharagpur Cell</td>
</tr>
<tr>
<td>10</td>
<td>Development of Software Packages for Waveguide-based Microwave Circuits</td>
<td>ISRO- IIT Kharagpur Cell</td>
</tr>
</tbody>
</table>

Consultancy Projects :

<table>
<thead>
<tr>
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<th>Title of the Project</th>
<th>Sponsor(s)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Preparation of Vision/theme and feasibility report</td>
<td>Tirupati Assets Pvt. Ltd., Kolkata</td>
</tr>
<tr>
<td>2</td>
<td>Development of Educational Complex</td>
<td>Tirupati Assets Pvt. Ltd., Kolkata</td>
</tr>
<tr>
<td>3</td>
<td>Chemical &amp; EMI Testing of Converter</td>
<td>M/S Leader Auto Gas (I) Pvt.Ltd., Mumbai</td>
</tr>
<tr>
<td>4</td>
<td>RF Fundamentals for Wireless Network</td>
<td>WMNetServ Ltd., Bangalore</td>
</tr>
</tbody>
</table>
INVITED LECTURES BY FACULTY MEMBERS

1. Prof. Ajay Chakrabarty  EMI / EMC & Mobile Antenna (Nirma University)
2. Prof. Ajay Chakrabarty  EMI / EMC (Future Institute of Technology, Sonarpur)
3. Prof. Ajay Chakrabarty  EMI / EMC (BIT Mesra)
4. Prof. Ajay Chakrabarty  EMI / EMC (NIT Durgapur)
5. Prof. Ajay Chakrabarty  EMI / EMC (DIATM, Durgapur)
6. Prof. Ajay Chakrabarty  EMI / EMC (IEEE Conference in Calcutta)
7. Prof. Ajay Chakrabarty  EMI / EMC (Jadavpur University)
8. Prof. Ajay Chakrabarty  EMI / EMC (Bengal Engineering College)
9. Prof. Ajay Chakrabarty  EMI / EMC activity, EMI/EMC, Mobile antenna (INCEMIC)
10. Prof. Ajay Chakrabarty  EMI / EMC (BITS Pilani)
11. Prof. Ajay Chakrabarty  Advanced Microwave Technology (University Institute of Technology, Barkatullah University)
12. Prof. Ajay Chakrabarty  EMI / EMC (BIT Mesra, Ranchi)
17. Prof. Ajay Chakrabarty  EMI / EMC (Siksha ‘O’ Anusandhan University Bhubaneswar, Orissa) February 05, 2008
18. Prof. Ajay Chakrabarty  Advances in EMI / EMC (Siksha ‘O’ Anusandhan University Bhubaneswar, Orissa) February 05, 2008
20. Prof. Ajay Chakrabarty  Electromagnetics and Application WEMA-08 (Bonam Venkata Chalamayya Engineering College, J.N.T University, Hyderabad) March 08-09, 2008
21. Prof. Ajay Chakrabarty  Relevance of EMI in the Battlefield DEFCOM
22. Prof. Ajay Chakrabarty  

23. Prof. Amit Patra  
Power Management Circuits (National Semiconductor Corporation, Santa Clara, USA)

24. Prof. Amit Patra  
Power Management Circuits (Intel Corporation, Portland, Oregon, USA)

25. Prof. Amit Patra  
Online Testing of Digital VLSI Circuits (Intel Corporation, Portland, Oregon, USA)

LECTURE BY VISITING EXPERT

1. Dr. Saba Mudalier  
Some Aspects Electromagnetic Scattering
Air Force Laboratory, Hanscom
USA

THESES (Doctoral and MS)

# Name of Scholar Title of Thesis
1. Priyanka Mandal  
Design & Analysis of Microwave Antennas and Passive Components for Wireless Communication

2. Mainak Mukhopadhyay  
Some Studies on Global Postioning System Anti – Jamming Technique for GPS and Smart Antennas

3. Gautam Mohanti  
Design of Phase – only Reconfigurable Linear Algebra Arrays Using Genetic Algorithms

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

1. “Wireless Communications & Networks”  
April 04-05, 2007

2. “Wireless Networks”  
April 11-12, 2007

3. “Teletraffic Engineering”  
April 30 – May 01, 2007

4. “Teletraffic Engineering”  
September 20, 2007

5. Microwave Laboratory Experiments for Faculties and Laboratory Technicians  
May 28 – June 02, 2007

6. “Communication & IP-Core Design”  
July 09–20, 2007

7. “MEMS & Cryogenics”  
January 13–16, 2008

8. “Control & Materials”  
(CASST–2008)
NATIONAL CADET CORPS (NCC)

COMMANDING OFFICER : Wg. Cdr. A. K. Bhattacharjee

AIMS & OBJECTIVES

(i) To develop qualities of character, courage, comradeship, discipline, leadership, secular outlook, spirit of adventure & sportsmanship and the ideas of selfless service among the youth to make them useful citizens.

(ii) To create a human resource of organized, trained and motivated youth, to provide leadership in all walks of life including the Armed Forces and be always available for the service of the nation.

(iii) To create suitable environment to motivate the youth to take up a career in the Armed Forces.

MAJOR ACTIVITIES

During the training year 2007-2008, 224 cadets of 1st year and 2nd year of engineering were trained as NCC cadets. One Service Officer, one Associated NCC Officer and 12 service personnel were involved in imparting NCC training to the IIT students.

LECTURES BY VISITING EXPERTS

Experts came from Air Force Station, Kalaikunda to deliver lectures to the cadets regarding Fire Extinguisher & First Aid.

SEMINARS / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANIZED

1. A Combined Annual Training Camp was conducted for all 1st year NCC cadets at Pingla, West Medinipur. The cadets were kept under hectic schedule. Drill practice, Physical training, Games, Debates, Quiz competition and cultural programs kept the cadets glued with thrill and excitement. Co-ordinator, Dean and Deputy Director also paid visit to the camp. November 26 – December 05, 2007
STUDENTS ACTIVITIES RELATED TO NSS

National Service Scheme (NSS) Unit of the Institute is functioning with registered 523 undergraduate students of 1st and 2nd year level. It took up several service oriented activities in the fringe villages of IIT Kharagpur campus. The important activities include, providing basic education to the school-going and school-dropout children residing in and around the campus; preparation of overall developmental plan for the nearby slums; improvement and protection of environment in the campus including plantation of 600 plants and up keeping of about 1200 plants in the campus; preparation and demonstration of scientific and technological models at Nehru S&T Museum; conducting survey on health, sanitation and hygiene of people living in the fringe villages like Balarampur, Gopali, Pathri, and Sampetabosti to understand the present scenario for organising health awareness camping programme in the area; conducted a Health awareness cum First Aid training camp for 169 NSS volunteers in collaboration with Indian Red Cross Society, IIT Kharagpur Campus unit. Besides the regular activities as mentioned above, the NSS unit organised the Annual Camp partly at Kultikri village in Sankrail Block of West Midnapore and partly at the IIT campus during 24th November to 2nd December, 2007 with the participation of 150 male and female student volunteers.
RAJBHASHA VIBHAG

CHAIRMAN: Professor Parmeshwary Dayal Srivastava

Rajbhasha Vibhag earlier known as 'Hindi Cell' was attached with the Department of Humanities & Social Sciences. Its main activities were limited to translate Institute's Annual Report and Annual Accounts from English to Hindi for sending them to Ministry for their placement in the Parliament. Later, it was felt that Institute has to play greater role in the implementation of Official Language Policy of the Government of India. As a result, Rajbhabha Vibhag was separated from the Department of Humanities & Social Science in the Academic year 2006-2007. Since then it functions as an independent entity in its new office situated at old building.

It has a well established setup with fullfledged Library of not less than 600 Hindi books. It has latest bi-lingual software for preparation of documents in bi-lingual form. It has been assigned with the responsibility of implementation of Official Language. Its activities include translation of Annual Reports, Annual Accounts, Audit Reports, different nameplates, preparation of Degrees / Diplomas in Hindi and publication of a monthly Hindi magazine "Jharokha" and "Awaaz", a student magazine in Hindi. A “Hindi Day” was organised in the month of September 2007 in which several competitions were held for both Hindi and non-Hindi speaking employees. Cash prizes were given to successful participants.

On 1st October 2007, Prof. P. D. Srivastava joined as a Chairman of Rajbhasha Vibhag. After taken over the charge by Prof. P. D. Srivastava, various committees such as Advisory, Publication, Executive and Sub-committees in every department are formed in order to have a greater interaction with the other departments of the Institute and for running smoothly various activities related to the Official Language Policy Implementation. A two days workshop on Official Language Policy and its Implementation (December 18-19, 2007), Training Programme on Working Knowledge of Hindi (February 26-27, 2008) and a Five days Translation Training programme (May 13-17, 2008) were organized. Approximately 100 employees from various departments are benefited by these programmes. Most of the Resource Persons for these programmes are directly related to Rajbhasha Vibhag, Delhi, Bangalore and Kolkata.

A Town Official Language Implementation Committee (TOLIC) has been constituted by the Ministry of Home Affairs, Rajbhasha Vibhag, GOI vide its letter No. 12024/3/2008/Raj.Bha (Impl-2) under the Chairmanship of the Director, IIT Kharagpur. All the Central Government Office located in and around Kharagpur are members of this Committee. The Director has nominated the Prof. P. D. Srivastava as the Chairman to look after day to day works of the TOLIC and Mr. Kishore Kumar of Rajbhasha Vibhag has been nominated to act as Secretary of the TOLIC.
Research plays an integral role in the pursuit of IIT Kharagpur’s vision for the future. The scientific and technical themes that are changing the world – *computation and information technology, life sciences and biotechnology, nanotechnology* and *energy and the environment* – are at the center of IIT Kharagpur’s research focus.

IIT Kharagpur’s research programs reach across the campus and beyond, linking together 19 Departments, 13 academic Centers and a large number of advanced R&D laboratories, stimulating the integration of inquiry, new knowledge and education.

With the discovery of new scientific concepts and technologies, especially in emerging interdisciplinary fields, this institute continues to carry out research and development in a number of unique thrust areas. IIT Kharagpur has developed relationships with hundreds of academic institutions, funding agencies, and a large number of industrial affiliates all over the country and the world on specialized projects.

IIT Kharagpur has special expertise in *advanced chip design and CAD for VLSI and MEMS* including in niche areas like *formal verification* where it works hand in hand with international organizations. The areas of software development, planning, management, ERP are core capabilities of the Institute. The large gamut of specialized *software technologies* include *power management software* (used by Power Grid Corporation), *telemedicine software* (currently used in several remote sites in several States), *communication empowerment software for physically challenged*, software for medical measurements and tools for *security and biometric authentication*. Other important software developed include a specialized *bond-graph based technology* that is used in a variety of areas for analysis of dynamics by companies within and outside the country, a *biomechanics simulator* that is now deployed in industry and a fluid mechanics and ocean dynamics based *software for storm surge* measurements that has been deployed in several countries. A fully functional *ERP software* has been developed and implemented, Neyveli Lignite Corporation and other organizations.

Life Sciences research forms a major thrust area with special emphasis in *medical science and technology*. A unique *male contraceptive, RISUG* is undergoing third phase of trials. Interdisciplinary research is being carried out in areas of *non-invasive measurements, advanced image processing, medical implants, protein structure analysis and drug design, orthopedic biomechanics* and brain research. Green technology routes have produced unique protocols for *insect resistant cotton, jute, bio-hydrogen, separation and purification of anti-carcinogenic components from green tea leaves*, etc. Research in biotechnology has resulted in a number of high quality *enzymatic processes for a variety of food technologies* several of which have been transferred.
The Institute is working towards development of major research hub in nanotechnology. Research in *nano-materials, smart composites, polymers* (especially rubber technology) and *metallurgy* include unique microstructures prepared from gelcast ceramics, nano-composites, nano-wires, semiconductors and metal alloys. The MEMS group has made significant contributions to national research programmes of ISRO and DRDO by development of advanced *accelerometers, gyros, micro-valves*, etc. The area of *micro-fluidics and bio-nanomems* has developed new techniques for *DNA hybridization and micro-scale cooling for electronic components*. The Institute has special expertise in advanced *plasma technologies and plasma based materials* that are being used for advanced research for industrial, strategic and biomedical areas.

A new thrust has been provided in energy research including *fuel cell based systems and energy materials*. The current on-going research activities in *mechanical sciences* include thermal engineering, CFD, motion and vibration dynamics, *robotics* and robot development, etc. The Institute has developed *state-of-the-art cutting tools* comparable to the best available worldwide. Prototype vehicle development activities include development of a large *autonomous underwater vehicle*, fault-tolerant micro-aero vehicle, hovercraft and electric vehicles.

During the year 2007-2008, the Institute received from government, private and international funding agencies / enterprises 365 research and consultancy projects for a total value of Rs. 126.34 crores (30 million USD – almost 150% increase over last year).

Industry–academia partnership has assumed new dimension in the last year. Many technology-intensive industrial houses are increasingly forming partnerships in joint research projects, acquiring technologies developed in the Institute and seeking consultancy supports from the Institute. Some of the major research initiatives in recent years include establishment of major R&D Centers (eleven specialized laboratories) in Energy Sector in collaboration with DVC, Enhancing research capacity and initiating integrated M.Tech. and Ph.D. Programme in the area of Food Science & Technology, sponsored by Department of Biotechnology, Government of India, Steel Technology Center, Vodafone-Essar-IIT Kharagpur Centre of Excellence. In Telecommunications, National Program in Marine Hydrodynamics, Centre of Excellence in Information Assurance, National facilities for EPMA, General Motors Collaborative Research Laboratory in Electronics Controls and Software (ECS) and a Regional Center for Rural Technology Action Group (RUTAG) are some of the recent such successful initiatives.

*IndAc2008*, an exposition to showcase the technologies developed by the faculty and students was organized in April 2008 in the campus. The whole event was conceived, organized and managed by the student community under the banner of Technology Transfer Group (TTG) and was attended by representatives of many of the top corporate houses of the country who showed keen interest in licensing several technologies.

The Intellectual Property Rights and Industrial Relations (IPR & IR) Cell under SRIC is responsible for the licensing and the transfer of technologies developed by faculty members, students and other researchers at IIT Kharagpur to the commercial sector. IIT Kharagpur has a long tradition of protecting inventions and has applied for 190 patent applications over the years out of which 96 have been granted.
MAJOR IMPROVEMENTS

(1) The infrastructural development has been made in consonance with the requirement of the office space as well as other necessities.

i) Creation of additional seating capacity (to accommodate Entrepreneurs including students, faculties and general public)

ii) Purchase of PCs for improvement of computing infrastructure

iii) Upgradation of existing PCs

iv) Upgradation of conferencing facilities

v) Enhancement of toilet facilities

vi) Realignment of office space

vii) Creation of Entrepreneurs Lab as common use computational facilities.

(2) Appointment of trained professionals for newer programs and streamlining existing ones.

(3) Purchase of essential equipments (fire safety, raincoats and boots for laborers etc.) has been given priority in consonance with our vision to bring a level of security within the STEP boundaries.

(4) Landscaping of STEP in order to provide a facelift to the entire surrounding area other than the main building.

(5) Infrastructural development of the old building of STEP for proper facilitation of the incubatees.

i) The entire old building has been painted and spruced up to give it a proper look

ii) The adjoining maintenance has been improved along with basic facilities upgraded

iii) Additional work is on to improve the central arcade to improve space utilization

iv) Additional cubicles have been put into place to cater to the needs of larger number of entrepreneurs

RESEARCH AND DEVELOPMENT

Brief descriptions of on-going activities:
### The Entrepreneurial Activities at STEP IIT Kharagpur premises:

<table>
<thead>
<tr>
<th>#</th>
<th>Companies under Incubation</th>
<th>Major Entrepreneurial Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>P2 Power Solutions Pvt. Ltd.</td>
<td>Work in the domain of <strong>Power Quality enhancement</strong> at distribution level helping industries strengthen their power assets through avant-garde technology and technical expertise. In today’s highly competitive environment, poor Power Quality and inefficient usage of power can significantly erode net earnings due to high operating costs. Installation of P2 power products reduces operating costs by improving the efficiency of the power supply system and almost eliminating failures and trips due to inefficient and poor Power Quality.</td>
</tr>
<tr>
<td>2.</td>
<td>DataResolve Systems</td>
<td>DataResolve Systems offers the most innovative product and services for information and data security. All the products and services of the company revolve around the issue of securing different forms of electronic data in the form of files, archives of a corporate firm lying unprotected anywhere in the world which is potentially prone to theft.</td>
</tr>
<tr>
<td>3.</td>
<td>ElectroSoft Consultants</td>
<td>Involved in several sponsored and consultancy projects dedicated towards empowerment of physically challenged people, automation and control systems, to preparation of Vision and Theme papers.</td>
</tr>
<tr>
<td>4.</td>
<td>Centre for Advanced Communication</td>
<td>Interactive Software Integrated Learning System (ISILS) is the heart beat, nerve centre, brain, driving force of our overall system.</td>
</tr>
<tr>
<td>5.</td>
<td>Integrated Chemical Industries</td>
<td>Integrated chemical Industries provides for manufacturing leather chemical and specialty chemicals for industrial use.</td>
</tr>
<tr>
<td>7.</td>
<td>National Institute of Science and Technology</td>
<td>It works in the field of software technology in consultancy mode.</td>
</tr>
<tr>
<td>8.</td>
<td>Hydro dyne</td>
<td>Work in the arena of Sophisticated Naval Architecture and design. Already constructed two hovercrafts which are undertaking comprehensive test run and trial to suit the long term needs of the Indian Navy.</td>
</tr>
<tr>
<td>10.</td>
<td>Focus R&amp;D</td>
<td>Software Research.</td>
</tr>
<tr>
<td>11.</td>
<td>Softlore Solutions</td>
<td>Training programs on various new software technologies.</td>
</tr>
</tbody>
</table>
It is noteworthy that STEP has come a long way and has become self driven and an independent entity. Thanks to the policies put into practice STEP has been put back into the tracks of progress with our own financial independence firmly in place. We have additional funds flowing for general use and maintenance from our business incubation and we hope to get better incubatees who can put the space being provided to them to quality use.

There are other 12 companies under the incubation of TIETS as well.

(ii) Entrepreneurial Activities at STEP-Gopali:

<table>
<thead>
<tr>
<th>#</th>
<th>Companies under Incubation</th>
<th>Major Entrepreneurial Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Electro Thermal Insulation</td>
<td>In the field of Insulation wires and polymer insulations</td>
</tr>
<tr>
<td>2.</td>
<td>Sandhya Glass works</td>
<td>Glass cutting work. Design of glass mirrors</td>
</tr>
<tr>
<td>3.</td>
<td>Gulton Rubber works</td>
<td>Making of Rice husk rollers</td>
</tr>
</tbody>
</table>

Present activities being undertaken at STEP-Gopali are as under:

(1) Redeployment of Manpower at STEP–Gopali so as to assist in the effective management of the entire area. The Resources have been redistributed in to assist in proper care of important horticultural activities like
   i) Ornamental
   ii) Medicinal plants and
   iii) The Heritage Tea Gardens

(2) Security – the security infrastructure of the entire STEP-Gopali area has been overhauled and a new security infrastructure put in place in order to keep unwanted elements at bay and to provide an efficient security cover at Gopali. The appointment of professional security guards has been done from January 2008.

(3) The breach and broken walls have been mended and fencing has been heightened to suit the requirements. Additional security apparatus has been kept aside in order to keep up pace with any exigency.

(4) Additional space of 1500 sq ft has been made available to entrepreneurs in order to keep their growing requirement of more space for entrepreneurial activities.

(5) Basic amenities needed for the day to day requirements of Entrepreneurs has been upgraded

(6) Realignment of activities of STEP–Gopali with the local people living in the vicinity in order to provide local solutions to local problems by integrating them with their needs and aspirations in tune with our Social entrepreneurship vision. STEP plans to implement projects keeping into consideration a healthy Return on investment (ROI) so as to attain a healthy SROI (Social Return on Investment) in the wider domains of EEEH (energy, health, environment and education) such as: Maternity care, Child and family welfare, Child education and nourishment.
(7) Rural Entrepreneurship has been vigorously promoted which will culminate in a rural entrepreneurship park to be possibly funded by DST (Department of Science & Technology).

(8) Process of translocation of Vermi-compost Unit from STEP IIT main campus to STEP-Gopali area has started and is in advance stages, beyond which the existing space will be freed up for a more qualitative use.

(9) The water and electricity problems being faced by the entrepreneurs have been resolved with negotiations with the government boards dealing with their supply.

(10) Managing director keeps in touch with the day to day activities at STEP-Gopali by weekly and daily appraisal reports sent to him in accordance.

(11) The MD makes sure to visit the place for timely meetings and discussions with the entrepreneurs.

Thrust Areas:

1. VLSI for Technology Business Incubation and high technology incubation
2. Agro based products at Gopali
3. Management Process for launching and sustaining Startups
4. Organic fertilizer through vermi-composting & its training Programs
5. Product focus in Energy, Environment, Education & Health

MISSION PROJECTS:

1. Recently a 2 Crores seed fund approval has been granted for setting up a VLSI based Technology Business Incubation at STEP on April 12th 2008.
2. The proposal for the starting of Small and Medium Scale Industries’ Business Incubator has been submitted to the Ministry of Small & Medium Scale industries.

NEW ORGANIZATIONS INCUBATING AT STEP

<table>
<thead>
<tr>
<th>#</th>
<th>Name of Company/Proprietor</th>
<th>Expertise Developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sparsh Learning Technologies</td>
<td>Develop and market software, courseware for teaching / learning / training in different areas</td>
</tr>
<tr>
<td>2</td>
<td>Proprietor: Biswanath Dey</td>
<td>Prepaid cash card for ATM system for Electric Bill</td>
</tr>
<tr>
<td>3</td>
<td>Xaneda Technologies India Private Limited</td>
<td>A whole new business in Analog Mixed Signal Design Service area in India</td>
</tr>
</tbody>
</table>

COLLABORATIVE EFFORTS

International collaborations
We have been at the forefront of entrepreneurial activities having already played host to eminent dignitaries from around the world. We have been honored to have with us some eminent luminaries from.

1. University of Colorado, Boulder
2. University of California, Berkeley

We also have guests from Korea, Finland and Israel as a result of our wider game plan to project the rich academic culture of IIT around the world. As part of our wider effort to bridge common ground having entrepreneurship as a common platform, Prof. Biswas visited Jyvaskyla University, Finland and participated as well as conducted various entrepreneurship sessions with the students.

Global Venture Lab

STEP, IIT Kharagpur, will be setting up the GLOBAL VENTURES LAB in collaboration with UC Berkeley, California, Jyvaskyla University, Finland and IIT Kharagpur to match the skills of various entrepreneurs to make the students the best entrepreneurs of the world. This came out of the Boot camp organized by UC Berkeley at CA which Prof. Biswas attended last December where a need was felt to upgrade the level of cooperation between the three universities to newer heights. It is accepted that the students of IIT Kharagpur have access to world class, innovative, highly technical, skilled manpower UC Berkeley students have an abundance of pertinent venture capital and entrepreneurial resources, JYU, Finland has an abundance of ideas and innovations.

VISIT OF EXPERTS

1. Prof. Dipankar Chakravarti, University of Colorado, Boulder, visited STEP, IIT Kharagpur in April 2008. He held discussions on issues of mutual importance along with social aspects of entrepreneurship. He also spent some quality time with the grass-root students of Entrepreneurship Development Program (EDP)
2. Dr. Mauno Harju, Development Director, Ph.D., Nanotechnology Cluster Program, Jyvaskyla Innovation Ltd. Finland, along with his team of three members visited STEP, IIT Kharagpur for Global Nanotechnology Business Incubator program and held discussions with the students and Professors of IIT Kharagpur on mutual areas of interest
3. Prof. Yongkyun Yoon, Choongbuk, South Korea with his team of ten members visited STEP IIT in the month of January 08 for initiating discussion on technology and innovation related aspects at the university level as well as collaborate with our knowledge repository

ONGOING TRAINING PROGRAMS

1. Technology Entrepreneurship Development Program (TEDP)

The TEDP program has been reengineered for grass root entrepreneurship relevant to semi urban and rural poor people. This time we have scaled up our TEDP to conduct 4 such programs for the grassroots entrepreneurs in the domains of EEEH (energy environment education and health) utilizing the vibrant ecosystem at STEP IIT KGP.
This effort is in consonance with the vision of local solutions to be provided to the local people by training the grass-root people in these four domains. The students are trained to serve themselves as entrepreneurs as well as these grass-root entrepreneurs are exposed to the environment of IIT for 6 weeks. This gives them self confidence to establish themselves.

2. **Faculty Development Program (FDP)**

A two weeks’ program positioned towards training faculties from other engineering colleges in the local area including IIT Kharagpur was sent and it was accepted by Department of Science & Technology. FDP is aimed at the faculties of the entire north-eastern and eastern region of India for the purpose of advancing the entrepreneurial culture in and around their region. Faculties from various places such as Jharkhand, West Bengal, Orissa and Assam had come to participate in the program. The approach is towards training the faculties so that they in return are able to train the students back home and create an entrepreneurial ecosystem. The FDP was received with admiration and was able to meet its desired objective of entrepreneurial knowledge propagation.
TRAINING & PLACEMENT SECTION

PROFESSOR-IN-CHARGE : Professor Balbir Kumar Mathur

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.

146 companies / organizations visited the campus for recruitment in 2007-2008. 14 others preferred to call the students for interviews to their offices. The details of number of students who had interested for placement and those actually placed through campus interviews are as follows :

<table>
<thead>
<tr>
<th>Course / Degree</th>
<th>No. of students interested</th>
<th>No. of students placed</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.Tech. (Hons.)</td>
<td>330</td>
<td>324</td>
</tr>
<tr>
<td>B.Arch. (Hons.)</td>
<td>009</td>
<td>08</td>
</tr>
<tr>
<td>M.Sc.</td>
<td>157</td>
<td>100</td>
</tr>
<tr>
<td>Dual Degree M.Tech.</td>
<td>159</td>
<td>156</td>
</tr>
<tr>
<td>M.Tech.</td>
<td>507</td>
<td>361</td>
</tr>
<tr>
<td>M.S.</td>
<td>018</td>
<td>16</td>
</tr>
<tr>
<td>M.C.P.</td>
<td>019</td>
<td>15</td>
</tr>
<tr>
<td>M.B.M.</td>
<td>117</td>
<td>116</td>
</tr>
<tr>
<td>M.M.S.T.</td>
<td>002</td>
<td>02</td>
</tr>
<tr>
<td>PGDIT</td>
<td>074</td>
<td>41</td>
</tr>
<tr>
<td>PGDTNM</td>
<td>010</td>
<td>04</td>
</tr>
<tr>
<td>PGDRD</td>
<td>002</td>
<td>00</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>003</td>
<td>03</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1407</strong></td>
<td><strong>1146</strong></td>
</tr>
</tbody>
</table>

SUMMER TRAINING

Eight weeks of Summer Practical Training at the end of 3rd year B.Tech / Dual Degree is a compulsory part of the B.Tech.(Hons.) / Dual Degree 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. An emergent trend is that more and more students are seeking summer training abroad.

A total of 1500 companies / organizations in India were contacted for training facilities for the last summer vacations in May-July 2007. Among these 130 in India had offered training facilities, out of which 94 organizations had extended out-of-pocket allowances (covering 254 students) and many other extended subsidized transport, subsidized canteen and/or
subsidized accommodation for our students. The highest out-of-pocket allowance of Rs. 20,000 per month was paid by Yahoo and six organizations extended Rs.15,000/- per month (Hindustan Lever Ltd., ITC Ltd., Schlumberger, Microsoft, Magma Design & Morgan Stanley, Barclay Capital, IBM and Siemens). Ten companies offered stipend in the range Rs. 10,000/- per month to 14,000/- per month and twenty organizations offered out of pocket allowance in the range Rs. 5000/- to Rs. 8,000/- per month and rest of the organizations offered below Rs. 5000/-.

350 students (all years) had taken up summer training in organizations abroad during the summer 2008. During summer 2008, a total of 580 third year B.Tech.(Hons.) / Dual Degree students were placed for summer training. The Department of Mining Engineering handled the placements of their students for summer training separately. A number of 2nd year B.Tech.(Hons) / Dual Degree and M.Sc. students were also placed for optional training.

STUDENT PARTICIPATION

To harness the student power, a formal system of student participation in the process had been initiated during 2005-2006. This has evolved and the 2007-2008 placement saw students participating in running placement process. In fact, through this participation it was possible to run up to seven / eight companies per day and round the clock. Students take active part in calling up companies and managing the logistics of placement.
TECHNOLOGY TELECOM CENTRE

PROFESSOR-IN-CHARGE : Professor Ratnam Varada Raja Kumar

Officer :

| Gupta, Pankaj | B.Tech. in Computer Engineering |

NEW PLANNING

i) Planning to lay the underground cable to each independent Quarter (B & C1 type) in Dandakaranya Area to minimize the maintenance problem.

ii) Building a Wimax Network in the Campus

WORK DONE

i) Telephone facilities provided to Rajiv Gandhi School of Intellectual Property Law

ii) Telephone facilities provided to Rani Laxmi Bai Hall of Residence

iii) Apart from the above, new telephone connections are being provided to newly joined faculties and newly opened Labs. The total analog numbers installed are 2503.
TECHNOLOGY STUDENTS’ GYMKHANA

PRESIDENT: Professor Manish Bhattacharjee

ACTIVITIES

Inter IIT Sports Meet:

The 43rd Inter IIT Sports Meet began with the Inter IIT Aquatic Meet held during October 02–05, 2007, at IIT Bombay. IIT Kharagpur secured overall 2nd position in Swimming both in Men’s & Women’s categories. Extra ordinary performance in swimming by Chirag Fialoke, a first year UG student, was the highlight of the meet. He got 13 medallions, which include 10 Gold medals, 2 Silver medals and one Bronze medal. The second phase, which includes all other games, started from December 13th to 21st, 2007. IIT Kharagpur secured Silver Medal in Badminton, Bronze in Weight Lifting, Basketball and Cricket.

Inter Hall Competitions in Sports and Games:

During the Autumn Semester Inter Hall competitions started with the Inter Hall Aquatic competitions in the month of August 2007. MMM (HK), an UG first year hall, won the Championship followed by Nehru and Patel Hall in second and third positions. Chirage Fialoke, a first year UG student, became the Individual Champion. Inter Hall Athletics Meet was held from 3 to 4th November, 2007. RP Hall of Residence became the Champion. LLR and Azad Halls secured 2nd and 3rd positions.

In the Spring Semester the second phase of inter hall competitions in cricket, football, hockey, basketball, volleyball, badminton, table tennis, tennis and weight lifting are held. Patel Hall of Residence bagged the Overall General Championship in Sports & Games for the year 2007-2008

For the first time the Inter Hall Competitions among the girl’s hostels are introduced on experimental basis. Competitions in table tennis, badminton, swimming and basketball are held.

Inter Hall Competitions in Social & Culture Events:

As usual the Inter Hall competitions in various social & culture events are organized. Nehru Hall of Residence became the Overall General Champion in Social & Culture. The traditional Inter Hall Illumination & Rangoli competition was organized with great enthusiasm. RP Hall and Nehru Halls became champions in Illumination and Rangoli competitions respectively.

Inter Hall Competitions in Technology:

Inter Hall competitions in Technology is gradually getting a good momentum. This year competitions are held in various categories Azad Hall Residence won the Overall General Championship in Technology for the year 2007-08.
MAJOR EVENTS ORGANISED

Spring Fest’08 :

The Spring Fest’08 was organized during January 24th and 26th, 2008. This year participation from colleges from various parts of country was very good. Artists like Sukhvinder Singh, Pandit Viswamohan Bhat entertained audience. The Hasya Kavi Sammelan as usual delighted TOAT-full audience.

Kshitiz’08 :

The Annual Tech Fest Kshitiz’08 was organized during February 4th and 7th, 2008. Around 6000 participants from various colleges of India and abroad took part in various competitive events like Business Plan, Advertisement designing, case studies to Paper presentations, Computer programming and Robotics. Presence of stalwarts of scientific, technical and managerial domains like Prof. K. Eric Drexler, renown Astrophysicist Prof. Lawrence M. Krauss, the Founder of Wikipedia Mr Jimmy D. Wales, Environmental Lawyer Mr. M.C. Mehta, Intel Country Manager Mr. Ramamurthy Sivakumar, Google Product Manager Mr. Surojeet Chatterjee, and eminent Car Designer Mr. Dilip Chhabria gave the participants a great learning ambience. Participants also showed great talent in innovations and creations.

Ajay Ghosh Memorial Trophy Cricket Tournament :

The Ajay Ghosh Memorial Trophy Tournament, an Inter University Cricket tournament among the universities of West Bengal, affiliated to the Cricket Association of Bengal, was held during 2nd Nov’07 to 8th Nov’07. The Cricket Association of Bengal financed the tournament and Technology Students’ Gymkhana was the host. Calcutta University and Kalyani University became Champion and Runner Up.

OUTSIDE PARTICIPATIONS

West Bengal Inter University Football Tournament :

The Football Team of IIT Kharagpur participated in the Exide Vidyasagar Trophy Football Tournament organized by the Indian Football Association (I.F.A.). The tournament held at Howrah Stadium, Howrah.

All India Inter Technical College day-night cricket tournament :

The Cricket Team of IIT Kharagpur participated in the All India Inter Technical College Day & Night Cricket Tournament organized by Indian School of Mines, Dhanbad, from 27th to 30th March, 2008

Inter Engineering Badminton Tournament :

The Badminton Team of IIT Kharagpur participated in the Inter Engineering Badminton Tournament held at Sambalpur and won Gold
Ramachandra Memorial Tennis Tournament:

The Tennis team of IIT Kharagpur participated in the Ramachandra Memorial Tennis Tournament organized by Midnapore District and secured second position. The Staff Team, comprising Mr. S. A. Rai and Mr. T. K. Guchhait, became the Runner up in Veterans Category.

DEVELOPMENTS

i) Development of a new Modern Gymnasium with modern equipments
ii) Development of Swimming Pool with chlorine plant to clean water

NEW ACQUISITIONS

i) Equipments of international standard for Athletics
ii) Bowling Machine for training in cricket
iii) Multiple Practice Net facility for training in Cricket
iv) Imported equipments for Modern Gymnasium
v) Billiards Table
vi) Golf Kits
vii) Roller and Lawn Mowers for maintenance of play fields

FACILITIES

i) Modern Gymnasium
ii) Billiards
iii) Athletics Stadium with modern training facilities
iv) Two Cricket Fields with modern practice facilities
v) Six Tennis Courts including two flood lit courts
vi) Two flood lit Volleyball Courts
vii) Two flood lit Basketball Courts
viii) One wooden Badminton Court
ix) Table Tennis room with two tables
x) Yoga room
xi) Standard Swimming Pool
PART - III

STATISTICAL INFORMATION
### TABLE : A-1

**ADMISSION TO UNDERGRADUATE (B.TECH./B.ARCH./M.SC./DUAL DEGREE) COURSES IN THE SESSION 2007-2008**

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**Total (A) :** 330  64  34  428(16)  333  76  13  422  329  74  13  416
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<td><strong>TOTAL (A + B + C + D):</strong></td>
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* Under PD category a maximum of one seat in each course is reserved subject to 3% of total seats i.e. 27 seats.
** Including preparatory and re-admission.
**TABLE : A-2**

**ADMISSION TO 2-YEAR M.SC. COURSES, 2007 – 2008**

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DISCIPLINE-WISE BREAK-UP OF STUDENTS AWARDED M.C.M. SCHOLARSHIP 2007-2008

Rate of Scholarship : Rs. 1000/- p.m. plus Free-tuitionship

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<td>3&lt;sup&gt;rd&lt;/sup&gt; yr.</td>
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<td>2&lt;sup&gt;nd&lt;/sup&gt; yr.</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; yr.</td>
<td>4&lt;sup&gt;th&lt;/sup&gt; yr.</td>
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1. ENDOWMENT PRIZES - (UNDERGRADUATE) :

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<th>Name of Prize</th>
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<th>Amount (Rs.)</th>
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### 3. BEST PROJECT AWARD:

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<th>Amount (Rs.)</th>
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<tr>
<td>13</td>
<td>Manufacturing Science &amp; Engineering</td>
<td>Vishal Garg</td>
<td>04MF3006</td>
<td>1,000.00</td>
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<tr>
<td>14</td>
<td>Metallurgical &amp; Materials Engineering</td>
<td>Sudhanshu Shekhar Singh</td>
<td>04MT1011</td>
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<tr>
<td>15</td>
<td>Mining Engineering</td>
<td>Vinay Kumar Pilania</td>
<td>04MI3006</td>
<td>1,000.00</td>
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<tr>
<td>16</td>
<td>Ocean Engineering &amp; Naval Architecture</td>
<td>Vineet Bhawdaj</td>
<td>04NA1014</td>
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<td><strong>b) 5-Year Dual Degree Courses:</strong></td>
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<td>1</td>
<td>Aerospace Engineering (AE1)</td>
<td>Abhishek Halder</td>
<td>03AE3009</td>
<td>1,000.00</td>
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<td>2</td>
<td>Agricultural &amp; Food Engineering (AG1)</td>
<td>Konica Gupta</td>
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<td>1,000.00</td>
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<td>Biotechnology &amp; Biochemical Engineering (BT1)</td>
<td>Riddhiman Dhar</td>
<td>03BT3010</td>
<td>1,000.00</td>
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<td>Chemical Engineering (CH1)</td>
<td>Ankur Gupta</td>
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<td>Civil Engineering (CE1)</td>
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<td>Computer Science &amp; Engineering (CS1)</td>
<td>Kumar Puspesh</td>
<td>03CS3025</td>
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<td>Electrical Engineering (EE1)</td>
<td>Paritosh Pande</td>
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<td>8</td>
<td>Electronics &amp; Electrical Communication Engineering (EC1)</td>
<td>Jointly : Saurav Bandyopadhyay</td>
<td>03EC3205</td>
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<td>9</td>
<td>Industrial Engineering &amp; Management (IM1)</td>
<td>Ankit Kumar Gandhi</td>
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<td>Amod Kumar Jain</td>
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<td>Akshay Mishra</td>
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<td>Mechanical Engineering (ME4)</td>
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<td>Nikhil S Prakash</td>
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<td>Mining Engineering (MI1)</td>
<td>Lalit Sharma</td>
<td>03MI3004</td>
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<td>16</td>
<td>Ocean Engineering &amp; Naval Architecture (NA1)</td>
<td>Rajnish Kumar</td>
<td>03NA3008</td>
<td>1,000.00</td>
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**c) 5-Year M.Sc. Courses :**

| 1 | Industrial Chemistry | Shiladitya Sen | 03CY2019 | 1,000.00 |
| 2 | Exploration Geophysics | Abhishek Raj | 03EX2011 | 1,000.00 |
| 3 | Applied Geology | Dip Shankar Nanda | 03GG2016 | 1,000.00 |
| 4 | Mathematics & Computing | Anindya Roy | 03MA2022 | 1,000.00 |
| 5 | Physics | Debyendu Mondal | 03PH2007 | 1,000.00 |

**d) 2-Year M.Sc. Courses :**

<p>| 1 | Chemistry | Arjun Sengupta | 06CY4001 | 1,000.00 |
| 2 | Geological Sciences | Arnab Ghosh | 06GG4009 | 1,000.00 |
| 3 | Geophysics | Uday Shanker Mishra | 06EX4002 | 1,000.00 |
| 4 | Mathematics | Jointly : 1) Hari Shankar Mahato 2) Supratim Das | 06MA4008 | 500.00 |
| 5 | Physics | Jointly : 1) Somnath Nag 2) Arunabha Saha | 06PH4006 | 500.00 |
| 6 | Statistics &amp; Informatics | Ishapathik Das | 06SI4006 | 1,000.00 |</p>
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<tr>
<th>#</th>
<th>Name of the Scholarship</th>
<th>Name of the Scholarship holder with Roll Number</th>
<th>Amount (Rs.)</th>
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<td>1</td>
<td>B. P. Poddar Scholarship</td>
<td>Siddhartha Sen, 04EC1030</td>
<td>1000/- P.M.</td>
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<td>2</td>
<td>Vinod Gupta Leadership Scholarship</td>
<td>S Muralidhar Duvvuri, 05AG3008</td>
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<td>Oliv Sen, 05ME1033</td>
<td>1000/- P.M.</td>
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<td>4</td>
<td>Hem Chandra Rout Memorial Scholarship</td>
<td>Umesh Gupta, 04NA3005</td>
<td>500/- P.M.</td>
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<td>5</td>
<td>Mrs. Minoti Bagchi Memorial Scholarship</td>
<td>Mahendra Shukla, 07SI2018</td>
<td>1000/- P.M.</td>
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<tr>
<td>6</td>
<td>Gour Chandra Saha Memorial Scholarship</td>
<td>Vaibhav Sharma, 06EC1027</td>
<td>1000/- P.M.</td>
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<tr>
<td>7</td>
<td>Puri Memorial Scholarship</td>
<td>a) Ashutosh N Bagaria, 04EE1035</td>
<td>1000/- P.M.</td>
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<td>b) Chanchal Kumar, 06CE1003</td>
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<td>c) Andhavarapu Radhika, 07MI1020</td>
<td>1000/- P.M.</td>
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<td>8</td>
<td>American Business List Humanities Scholarship</td>
<td>Sailesh Pati, 03EC3201</td>
<td>400/- P.M.</td>
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<td>9</td>
<td>Technology Alumni Association (Kharagpur Chapter) Scholarship</td>
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<td>1000/- P.M.</td>
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<td>10</td>
<td>Technology Alumni Association (Calcutta Chapter) Scholarship</td>
<td>Rasha Eqbal, 07CS1039</td>
<td>500/- P.M.</td>
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<td>11</td>
<td>K. K. Agarwal Memorial Scholarship</td>
<td>Devanshu Agrawal, 04AG1012</td>
<td>400/- P.M.</td>
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<td></td>
<td>Scholarship Name</td>
<td>Recipients</td>
<td>Amount</td>
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<td>---------------------------------------------------------------------------</td>
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<td>12</td>
<td>Indian Women’s Association, Bonn Scholarship</td>
<td>Soumya Shaw, 07HS2008</td>
<td>1500/- P.M.</td>
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<td>13</td>
<td>HPCL Start Up Scholarship</td>
<td>a) Neetesh Gupta, 07CS1007</td>
<td>1000/- P.M.</td>
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<td></td>
<td></td>
<td>b) Naveen Kumar, 07CS1008</td>
<td>1000/- P.M.</td>
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<td></td>
<td></td>
<td>c) Sumit Sinha, 07CS1009</td>
<td>1000/- P.M.</td>
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<td></td>
<td>d) Koushik Das, 07EC1037</td>
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<td>e) Nijwm Wary, 07EC1036</td>
<td>1000/- P.M.</td>
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<td>14</td>
<td>Devi Mahamaya Mallick Memorial Scholarship</td>
<td>Sri Ankit Pat, 07MA2003</td>
<td>1200/- P.M.</td>
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<td>15</td>
<td>Dr. Arunabha Chatterjee Memorial Scholarship</td>
<td>Anirban Gangopadhyay, 03PH2002</td>
<td>4380/- P.M.</td>
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<td>16</td>
<td>Goralal Syngal Memorial Scholarship</td>
<td>a) Sougata Sarkar, 04EC1004</td>
<td>2100/- P.M.</td>
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<td>b) Vinu Rajashekhar, 05CS3025</td>
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<td>c) Prateek, 06CS1006</td>
<td>2100/- P.M.</td>
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<td></td>
<td>d) Dheeraj Kr. Singh, 07CS1004</td>
<td>2100/- P.M.</td>
</tr>
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<td></td>
<td></td>
<td>e) Md. Jawaid Iqbal, 07CS1006</td>
<td>2100/- P.M.</td>
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<td></td>
<td>f) Amit Sharma, 06CS1025</td>
<td>2100/- P.M.</td>
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<td></td>
<td>g) Parth Sethi, 05CS1025</td>
<td>2100/- P.M.</td>
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<td></td>
<td>h) Rithe Rahulkumar Jagdish, 04EC1029</td>
<td>2100/- P.M.</td>
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<td>i) Ritesh Parikh, 04EC3207</td>
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<td>17</td>
<td>M. K. Sircar Memorial Scholarship</td>
<td>a) Ganshyam Meena, 06ME1003</td>
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<td></td>
<td>b) Kuldeep Kumar, 06MT1003</td>
<td>1000/- P.M.</td>
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<td>18</td>
<td>Prova Basu Memorial Scholarship</td>
<td>Sourav Saha, 05EE3002</td>
<td>12,000/- per annum</td>
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<td>19</td>
<td>Mrinal Chandra Basu Memorial Scholarship</td>
<td>Ankur Kothari, 04IE1015</td>
<td>12,000/- per annum</td>
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<td>20</td>
<td>ABS Scholarship</td>
<td>Yagnish Rathi, 04NA1008</td>
<td>1000/- P.M.</td>
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</table>
| 21 | Guru Kripa Educational Loan Scholarship | a) Koushik Hembram, 06EC3004  
   b) Raghav Agrawal, 06EC1012 | 750/- P.M.  
   750/- P.M. |
| 22 | Arjun Das Datta Memorial Scholarship | a) Md. Tanweer Alam, 06CS3012  
   b) Arit Kr. Mondal, 06CS1008  
   c) P. Deepak, 06EE1020  
   d) M. Ravikant, 06MT3009  
   e) Kushal Pandya, 06ME1030  
   f) Ankit Kumar, 07CE1001  
   g) I Priyadarshini Bobburi, 07BT3014  
   h) Kripasindhu Sarkar, 07CS3025  
   i) Adhihi Shwetha Adhi, 07AR1002  
   j) Abhirup Mallik, 07PH2009 | 2500/- P.M.  
   2500/- P.M.  
   2500/- P.M.  
   2500/- P.M.  
   2500/- P.M.  
   2500/- P.M.  
   2500/- P.M.  
   2500/- P.M.  
   2500/- P.M.  
   2500/- P.M. |
| 23 | Rajendra Nath Das Merit-cum-Means Awards | a) Sudip Roy, 05CS1035  
   b) Vaibhav Goel, 05EC1021  
   c) Himanshu Yadav, 05CG1033  
   d) K. M. Saravana Kumar, 05BT3013  
   e) Ullas Agrawal, 05ME3034  
   f) Gourav Khaneja, 06CS1017  
   g) Rahul Gupta, 06EE1027  
   h) Udit Kejriwal, 06ME1047  
   i) Vivek Khetan, 06CH3004 | 25,000/-  
   25,000/-  
   25,000/-  
   25,000/-  
   25,000/-  
   25,000/-  
   25,000/-  
   25,000/-  
   25,000/- |
| 25 | Dr. J. C. Ghosh Memorial Scholarship | Vajha Myna, 07EC1015 | 5000/- P.M. |
### TABLE : A-7

**STUDENTS AWARDED SCHOLARSHIPS BY EXTERNAL AGENCIES (2007-2008)**

<table>
<thead>
<tr>
<th>#</th>
<th>Awarding Organization</th>
<th>No. of Recipients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>National Council of Educational Research &amp; Training, Sri Aurobinda Marg, New Delhi - 16</td>
<td>101</td>
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<tr>
<td>2.</td>
<td>Directorate of Technical Education, West Bengal</td>
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<td>3.</td>
<td>Directorate of Technical Education, Assam</td>
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<td>4.</td>
<td>Directorate of Higher Education, Tripura</td>
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<td>5.</td>
<td>Directorate of Collegiate Education, Trivandrum, Kerala</td>
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<td>6.</td>
<td>Directorate of Technical Education, Bhopal, MP</td>
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<td>7.</td>
<td>SC and ST Development Department, Bhubaneswar, Orissa</td>
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<td>8.</td>
<td>Directorate of Higher Education, Arunachal Pradesh</td>
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<td>9.</td>
<td>Birsa Munda Scholarship, Jharkhand</td>
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<td>10.</td>
<td>Steel Authority of India Ltd., Durgapur, Rourkela, Bhilai, Vishakhapatnam Steel Plant, Bokaro</td>
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<tr>
<td>11.</td>
<td>Office of the Administrator, Mining Areas Development Fund, Government of Orissa</td>
<td>-</td>
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<td>12.</td>
<td>New Central Sector Scholarship for Top Class Education for SC Students, Ministry of S.J&amp;E, New Delhi</td>
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<td>13.</td>
<td>Department of Telecommunication, Calcutta</td>
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<td>14.</td>
<td>Central Coalfields Ltd., Ranchi</td>
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<td>15.</td>
<td>I.A.F. Benovolent Association, New Delhi</td>
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<td>16.</td>
<td>Department of Telecommunication, Bhubaneswar (BSNL)</td>
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<td>17.</td>
<td>Eastern Coalfields Ltd., Calcutta</td>
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<td>18.</td>
<td>Department of Telecommunication, Madras</td>
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<td>19.</td>
<td>Institute of Engineers, Calcutta</td>
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<td>20.</td>
<td>Oil and Natural Gas Commission, Calcutta</td>
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<td>21.</td>
<td>Jagadish Chandra Bose National Talent Search, Calcutta (JBNSTS)</td>
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<td>22.</td>
<td>Jubilee Scholarship Committee, TISCO, Jamshedpur</td>
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<td>No.</td>
<td>Organization/Institution</td>
<td>Location</td>
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<td>23.</td>
<td>Metallurgical &amp; Engineering Consultants (India) Ltd, Ranchi</td>
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<td>24.</td>
<td>Indian Oil Corporation Ltd., New Delhi</td>
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<td>25.</td>
<td>Bharat Petroleum Corporation Ltd., Bombay</td>
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<td>26.</td>
<td>Indian Council for Cultural Relations, Azad Bhaban IP Estate,</td>
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<td>Foreign Student Division, New Delhi</td>
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<td>27.</td>
<td>Indo-Bangladesh Scholarship</td>
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<td>Zindal Trust, New Delhi – OPJEM Scholarship</td>
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<td>CMRF, Government of Bihar, C.M. Secretariat, Patna</td>
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<td>30.</td>
<td>G.O.I. Scholarship, Government of Tamilnadu</td>
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<td>31.</td>
<td>NEC Scholarship, Guwahati, Assam</td>
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<td>32.</td>
<td>CMERI, Durgapur</td>
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<td>33.</td>
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<td>34.</td>
<td>Naval Research Fellowship (Scholarship), Naval HQ, New Delhi</td>
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<tr>
<td>35.</td>
<td>AR&amp;DB Scholarship, Ministry of Defence, Government of India</td>
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<td>36.</td>
<td>Coal Fields India Ltd.</td>
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<td>37.</td>
<td>Pratibha Scholarship, AP</td>
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<td>38.</td>
<td>Rajendra Vidyalaya, Jamshedpur</td>
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<td>39.</td>
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<td>NEC, Shilong</td>
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<td>Siksha Deep Trust, Raj Bhavan, Chhatisgarh</td>
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<td>42.</td>
<td>CBSE, New Delhi</td>
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<td>MECON, Ranchi</td>
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<td>44.</td>
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<td>45.</td>
<td>Tribal Welfare (GOI) Scholarship, Jabalpur, MP</td>
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**TOTAL:** 181
# TABLE: A-8

STUDENTS FROM FOREIGN COUNTRIES ON ROLL OF UNDERGRADUATE COURSES, CLASS WISE, 2007 – 2008

<table>
<thead>
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<th>#</th>
<th>Course</th>
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<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>
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<td>2</td>
<td>Agricultural &amp; Food Engineering</td>
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<td>Biotechnology &amp; Biochemical Engineering</td>
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COUNTRY-WISE DISTRIBUTION OF FOREIGN STUDENTS (2007-2008)

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**TABLE : A-11**

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### STATEMENT OF RESULTS OF POSTGRADUATE EXAMINATION M.TECH. / MCP / MBM 2006-2007 BATCH OF STUDENTS

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### TABLE : C-2

**NUMBER OF MS STUDENTS ENROLLED DURING 2007-2008**

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### TABLE : C-3

**NUMBER OF POST DOCTORAL FELLOWS ENROLLED DURING 2007-2008**

**NIL**
# TABLE : C-4(A)

**UGC SCHOLARS ENROLLED DURING 2007-2008**

<table>
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<tr>
<th>Dept/Centre/School</th>
<th>Total Number</th>
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<td>MA</td>
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# TABLE : C-4(B)

**UGC POST DOCTORAL FELLOWS ENROLLED DURING 2007-2008**

NIL

# TABLE : C-5

**NUMBER OF RESEARCH SCHOLARS FROM OTHER COUNTRIES**

NIL
<table>
<thead>
<tr>
<th>Department of Aerospace Engineering</th>
<th>Rajesh Kumar, Santanu Mitra, Udar Ratnakar Shankarrao</th>
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<tbody>
<tr>
<td>Department of Architecture &amp; Regional Planning</td>
<td>Basina Uma Sankar, Joydeep Dutta, Susmita Sen, Haimanti Banerji</td>
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<tr>
<td>Department of Biotechnology</td>
<td>Dipanjan Ghosh, Devrani Mitra, Rashmi Shrivastava, Hari Hara Surya Kumar Potula, Sampurna Sattar</td>
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<tr>
<td>Department of Chemical Engineering</td>
<td>Ujjal K Ghosh, Srikanta Dinda, Tapas Kumar Mandal, Arun Kumar Jana, Pinakpani Biswas, Pankaj Vijay Mathure, Chandan Das</td>
</tr>
<tr>
<td>Department of Civil Engineering</td>
<td>A. Mani, Navneet Pratap Singh, S. Ayoob, Puspendu Bhunia, Priyaranjan Pal</td>
</tr>
<tr>
<td>Department of Computer Science &amp; Engineering</td>
<td>Shibaji Banerjee, Sayantan Das, Abhishek Somani, Pramod Kumar Singh, Prasenjit Basu, Monojit Choudhury, V. Pallavi, Suchismoita Roy, Ansuman Banerjee</td>
</tr>
<tr>
<td>Department of Electrical Engineering</td>
<td>Leena G., Suvarjit Mukherjee, H. N. Nagaraja, Suvarun Dalapati, Rajesh Joseph Abraham</td>
</tr>
<tr>
<td>Department of Electronics &amp; Electrical Communication Engineering</td>
<td>Paramesha, Sushrut Das, Rajarshi Mahapatra, Benudhar Sahu, Mrinal Kanti Mandal, C. B. Ashesh, Nandedkar Abhijeet Vijay, Aruna Tripathy, Vustikayala Sivakumar Reddy</td>
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<tr>
<td>Department of Geology &amp; Geophysics</td>
<td>Rashmi, Vikas Chand Baranwal, Suman Das, Rajesh Kumar Naik, Saikat Sengupta, Swapnendu Goon</td>
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<tr>
<td>Department</td>
<td>Members</td>
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<td>Department of Humanities &amp; Social Sciences</td>
<td>Sudeep Budhaditya Deb, Vani Archana, Balivada Pavan Kumar, Shalini Dixit, Ujjwal Jana</td>
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<tr>
<td>Department of Industrial Engineering &amp; Management</td>
<td>Shivashankaragouda V. Patil, Ashutosh Sarkar, Subhash Chandra Panja, Asit Baran Bera, Chimata Murali Krishna, Preethi Upamaka</td>
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<tr>
<td>Department of Mathematics</td>
<td>P. Anantha Lakshmi Narayana, P. K. Parida, S. Dhinakaran, Narmada Behera, Ameeya Kumar Nayak</td>
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<tr>
<td>Department of Metallurgical &amp; Materials Engineering</td>
<td>Subhrangshu Moitra, Golap Mohammad Chowdhury, Animesh Mandal, Mervin A. Herbert, Kausik Chattopadhyay, T. Gnanadurai, V.M. Sreekumar</td>
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<tr>
<td>Department of Mining Engineering</td>
<td>Gyan Prakash Singh, Devi Prasad Mishra</td>
</tr>
<tr>
<td>Department of Ocean Engineering &amp; Naval Architecture</td>
<td>Joydip Bhattacharjee, Sanjay Pratap Singh, P. Suresh Kumar, Rajiv Sharma</td>
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<tr>
<td>Department of Physics &amp; Meteorology</td>
<td>Tarun Kumar Jha, Piyush Ranjan Das, Xavier V. F., Gourishetty Anil Kumar, Sanjay Kumar Mandal, Puja Dey, Dillip Kumar Pradhan, Rama Ghosh</td>
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<td>Cryogenic Engineering Centre</td>
<td>Soma Das</td>
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<tr>
<td>Materials Science Centre</td>
<td>Suparna Sarkar, Aparna Gupta, Somnath Biswas, Kunal Pal, Partha Pratim Sengupta, Samik Pal, Hiranmayee Satapathy, Sanjoy Sadhukhan, Tanya Das</td>
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<td>Reliability Engineering Centre</td>
<td>Naga Srinivasa Rao Pulimi</td>
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<tr>
<td>Rubber Technology Centre</td>
<td>Madhuchhanda Maiti, Anirban Ganguly, Samik Gupta, Sambhu Bhadra</td>
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<td>Sushanta Kumar Mandal</td>
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<td>School of Medical Science &amp; Technology</td>
<td>Sunil Kumar</td>
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<tr>
<td>Vinod Gupta School of Management</td>
<td>Rajesh Kumar B., Uttam Kumar Chatterjee, Madhurima Deb</td>
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<td>Department of Chemical Engineering</td>
<td>Rajaram Vijayan, Parama Ghoshal</td>
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<td>Anil Kumar Lenka</td>
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<td>Swapan Kumar Khatua</td>
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<td>c) In Savings accounts</td>
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<td>b) Instt. Development Fund</td>
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<td>b) To the State Government</td>
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<td>b) In savings accounts</td>
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Journals:


Seminars / Workshops / Conferences:


(ICTCEM 2007), held at the Indian Institute of Technology, Kharagpur, India (December 27-29, 2007)
RESEARCH PUBLICATIONS

Journals:

2. Bhande, S.D., Ravindra, M.R, and Goswami, T.K.; Respiration rate of banana fruit under aerobic conditions at different storage temperatures; J. of Food Engineering; 87 (1); 116-123; 2008
3. Chourasia, M. K, and Goswami, T. K.; Product cooling load and moisture loss under different loading pattern and cooling rate of potato in a cold store ; J Food Process Engineering; 31 (3); 339-353; 2008
4. Chowdhury, A. and Jha, M.K.; Ensuring sustainable water supplies; A study of groundwater conditions in Salboni Block, West Bengal; Environmental Quality Management (in press); 2008
6. Comparative study of thermostability and ester synthesis ability of free and immobilized lipases on cross linked silica gel ;Kumari, A., Mahapatra ,P., Vijay K. Garlapati, Banerjee R.; Bioprocess Biosystem Eng.; (2007)
9. Enzymatic polishing of rice - a new processing technology ;Das. Mithu, Bal Satish and Banerjee R.; Food Science and Technology; (2007)
10. Evaluation of physicochemical properties of enzyme treated brown rice; Das Mithu, Bal , Satish and Banerjee, R.; Food Science and Technology; (2007)
11. Goswami, T.K., and Gupta, S.K.; Detection of Dilution in Milk with the help of Glass Transition Temperature by Differential Scanning Calorimetry; African Journal of Food Science; 2; 007-010; 2008
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13. Igathinathane, C., Chattopadhyay, P.K., Pordesimo, L.O.; Moisture diffusion modeling of parboiled paddy accelerated tempering process with extended application to multi-pass drying simulation; J. of Food Engineering, UK; 88; 239-253; 2008
15. Kamilya, D., Joardar, S.N., Mal, B.C., and Maiti, T. K.; Effects of a Glucan from the
edible mushroom (Pleurotus florida) as an immunostimulant in farmed indian major carp (Catla catla); The Israeli Journal of Aquaculture – Bamidgeh; 60(1): 37-45; 2008


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24. Mukherjee, S., and Chattopadhyay, P.Y.; Whirling bed blanching of potato cubes and its effects on product quality; J. of Food Engineering, UK,: 78; 52-60; 2007

25. Multivariable parameter optimization for endoglucanase production by Trichoderma reesii Rut C30 from Ocimum gratissimum seed By; Das, Mithu., Banerjee, Rintu and Bal, Satish.; Brazilian Archives of Biology and Technology; (2008)


of parboiled paddy; J. Food Engg; 2007

32. Pandey, A., Chowdary, V.M., Mal, B.C. and Billib, M.; Runoff and sediment yield modeling from a small agricultural watershed in India using the WEPP model; Journal of Hydrology; 348; 305–319; 2008


34. Pathirana, A., Herath, S., Yamada, T., and Swain, D. K.; Impact of absorbing aerosols on South Asian Rainfall: A modeling study; Climatic Change (Springer); 85; 103-118; 2007


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45. Shibly, V. K, Sinija, V. R, and Mishra, H. N; Ready-to-eat health foods: A promising concept; Indian Food Industry J; 26 (6); 47-54; (2008)

46. Singh, Basant Kumar, Moulick Sanjib and Mal, B. C. Recirculating aquaculture system – an overview, National Workshop on Sustainability of Indian Aquaculture Industry, IIT Kharagpur; 126; IIT Kharagpur (2007)


49. Sinija, V. R, Tripathi Smita, Bag, S .K and Mishra, H. N; Lupin (Lupinus albus) –
Potential Food Applications; Processed Food Industry; 12; 27-33; (2007)
58. Swain, D. K., Rautray, S., and Ghosh, B. C.; Alkaline coal fly ash amendments are recommended for improving rice-peanut crops; Acta Agriculturae Scandinavica-section B Soil & Plant Science (Taylor & Francis) 57; 201-211; 2007
59. Swami, Shrikant Baslingappa., Das, Susanta Kumar., and Maiti, Biswajeet.; Texture Profile Analysis of Cooked Sun Dried Nuggets (Bori) Prepared with Different Levels of Moisture Content and Percent Air Incorporation in Its Batter; International Journal of Food Engineering (e-journal); 3; 2007
60. Tiwari, A., Kumar, A., and Raheman, H.; Biodiesel Production from Jatropha Oil (Jatropha Curcas); Journal of Biomass & Bioenergy; 31; 569-575; 2007

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4. Bhadoria P.B.S, Nad M absu.; Utilizing organic and industrial wastes in sabai grass-
peanut intercropping system to improve land productivity for sustainable production.; Int. conf; watermangment, IARI New Delhi 12; 2007

5. Bhadoria, PBS, M Basu and S C Mahapatra; Agriculture waste utilization to improve land productivity for sustainable production; Int. Agril. Engg Conf. at AIT Bangkok; 3-6 Dec. 2007

6. Bhadoria, PBS.; Integrating energy plan with village plan ; ISAE, Bhopal; 1-3 Feb. 2008


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