

# **Annual Report**

## **2006-2007**



**Indian Institute of Technology**  
**Kharagpur**

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## LIST OF THE MEMBERS OF IIT COUNCIL

(July 2006 – June 2007)

### 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	Chairman
(B) Chairman of each institute (Ex-officio)			
(i) Kharagpur	2.	Shri Sanjiv Goenka Chairman, BOG, IIT Kharagpur Kharagpur – 721 302	Member
(ii) Delhi	3.	Dr. V. S. Ramamurthy Chairman, BOG, IIT Delhi Delhi – 110 016	Member
(iii) Bombay	4.	Dr. Anil Kakodkar Chairman, BOG, IIT Bombay Mumbai – 400 076	Member
(iv) Madras	5.	Prof. A. E. Muthunayagam Chairman, BOG, IIT Madras Chennai – 600 036	Member
(v) Kanpur	6.	Shri M. Anandkrishnan Chairman, BOG, IIT Kanpur Kanpur – 208 016	Member
(vi) Guwahati	7.	Dr. M. K. Bhan Chairman, BOG, IIT Guwahati Guwahati – 781 039	Member
(vii) Roorkee	8.	Shri Jaiprakash Gaur Chairman, BOG, IIT Roorkee Roorkee – 247 667	Member
(C) Director of each Institute (Ex-officio)			
(i) Kharagpur	9.	Prof. S. K. Dube (Upto 30 <sup>th</sup> June 2007 Forenoon) Prof. Damodar Acharya (From 30 <sup>th</sup> June 2007 Afternoon) Director, IIT Kharagpur Kharagpur – 721 302	Member
(ii) Delhi	10.	Prof. Surendra Prasad Director, IIT Delhi New Delhi – 110 016	Member

(iii)	Bombay	11.	Prof. Ashok Misra Director, IIT Bombay Mumbai – 400 076	Member
(iv)	Madras	12.	Prof. M. S. Ananth Director, IIT Madras Chennai – 600 036	Member
(v)	Kanpur	13.	Prof. S. G. Dhande Director, IIT Kanpur Kanpur – 208 016	Member
(vi)	Guwahati	14.	Prof. Gautam Baura Director, IIT Guwahati Guwahati –781 039	Member
(vii)	Roorkee	15.	Prof. S. C. Saxena Director, IIT Roorkee Roorkee – 247 667	Member
(D)	Chairman, University Grants Commission (Ex-officio)	16.	Prof. Sukhdeo Throat Chairman University Grants Commission Bahadurshah Zafar Marg New Delhi – 110 002	Member
(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	Member
(F)	Chairman, Council of the Indian Institute of Science, Bangalore (Ex-officio)	18.	Dr. K. Kasturirangan Chairman Indian Institute of Science Bangalore – 560 012	Member
(G)	Director, Indian Institute of Science, Bangalore (Ex-officio)	19.	Prof. P. Balaram Director Indian Institute of Science Bangalore – 560 012	Member
(H)	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	Member

(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	Member
(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 00	Member
(I)	Nominee of the All India Council for Technical Education (AICTE)	23.	Prof. Damodar Acharya (Upto 30 <sup>th</sup> June 2007 Forenoon) Chairman, AICTE I.P. Estate I.G. Sports Complex New Delhi – 110 00	Member
(J)	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	Member
		25.	Prof. C. S. Seshadri Director Chennai Mathematical Institute, Chennai Plot H1, SIPCOT IT Park Padur PO Siruseri – 603 103	Member
		26.	Prof. Sabyasachi Bhattacharya Director Tata Institute of Fundamental Research Homi Bhabha Road Mumbai – 400 005	Member
		27.	Dr. Kota Harinarayan Chairman Research Council of Central Scientific Instrument Organization Raja Ramana Fellow National Aerospace Laboratory P.O. No. 1779 Bangalore – 560 017	Member
		28.	Shri Tarun Das Chief Mentor Confederation of Indian Industry Plot No. 249-F, Sector 18 Udyog Vihar, Phase IV Gurgaon – 122 015 (Haryana)	Member

- |   |     |   |        |
|---|-----|---|--------|
| (K) Three members of Parliament<br>(Two from Lok Sabha and one<br>from Rajya Sabha) | 29. | Shri Milind Deora<br>Member of Parliament (Lok Sabha) 65,<br>Lodhi Estate<br>New Delhi – 110 003  | Member |
|   | 30. | Shri Ananta Nayak<br>Member of Parliament (Lok Sabha) 180,<br>South Avenue<br>New Delhi – 110 001   | Member |
|   | 31. | Shri B. J. Panda<br>Member of Parliament (Rajya Sabha)<br>2, Mahadev Road<br>New Delhi – 110 001  | Member |
| (L) Secretary to the Council  | 32. | Shri Ravi Mathur<br>Joint Secretary (T)<br>Department of Secondary & Higher<br>Education<br>Government of India<br>Ministry of Human Resource<br>Development<br>Shastri Bhavan<br>New Delhi – 110 001 | Member |



## BOARD OF GOVERNORS

#	Name and Address	Position
1.	Shri Sanjiv Goenka Chairman, BOG, IIT Kharagpur & Vice-Chairman, RPG Enterprises CESC House, Chowringhee Square Kolkata – 700 001	Chairman
2.	Smt. Shanta Ghosh (Upto 10.10.2006) Managing Director Developments Consultants Ltd. (DCL) 24B, Park Street Kolkata – 700 016	Member
3.	Shri Roopen Roy (From 11.10.2006) Managing Director Deloitte & Touche Consulting India Pvt Ltd Bengal Intelligent Park, Building Alpha 1 <sup>st</sup> Floor Plot No.A2, M2 & N2 Block–EP & GP, Sector-V Salt lake Electronics Complex Kolkata – 700 091	Member
4.	Dr. Chitaranjan Pratap (Upto 01.01.2007) Director Department of Science & Technology Government of Bihar Patna – 800 015	Member
5.	Dr. Dhruv Prasad (From 02.01.2007) Director Department of Science & Technology Government of Bihar Patna – 800 015	Member
6.	Prof. O. N. Mohanty Vice-Chancellor Bijupatnaik University of Technology Rourkela Camp Techno Campus CET Ghatikia, Kalinganagar Bhubaneswar – 751 003	Member
7.	Shri B. Muthuraman Managing Director, Tata Steel The Tata Iron & Steel Co. Ltd. (TISCO) Jamshedpur – 831 001	Member
8.	Shri Sudeep Banerjee (Upto 31.10.2006) Secretary Ministry of HRD, Government of India Department of Higher Education Shastri Bhawan New Delhi – 110 001	Member

- |     |  |           |
|-----|--|-----------|
| 9.  | Shri R.P. Agrawal (From 01.11.2006)<br>Secretary<br>Ministry of HRD, Government of India<br>Department of Higher Education<br>Shastri Bhawan<br>New Delhi – 110 001                        | Member    |
| 10. | Prof. T. P. Singh<br>Head of the Department (Bio-Physics)<br>All India Institute of Medical Sciences (AIIMS)<br>Ansari Nagar<br>New Delhi – 110 029  | Member    |
| 11. | Dr. Kiran Karnik<br>President<br>National Association of Software and Service Companies<br>(NASSCOM)<br>International Youth Centre<br>Teen Murti Marg, Chanakyapuri<br>New Delhi – 110 021 | Member    |
| 12. | Prof. S. K. Dube (Upto 30.06.2007)<br>Director<br>IIT Kharagpur – 721 302  | Member    |
| 13. | Prof. D. Acharya (From AN of 30.06.2007)<br>Director<br>IIT Kharagpur – 721 302  | Member    |
| 14. | Prof. M. Chakraborty<br>Department of Metallurgical & Materials Engineering<br>IIT Kharagpur – 721 302   | Member    |
| 15. | Prof. H. R. Tewari<br>Department of Humanities & Social Sciences<br>IIT Kharagpur – 721 302  | Member    |
| 16. | Dr. D. Gunasekaran<br>Registrar<br>IIT Kharagpur – 721 302   | Secretary |

## **FINANCE COMMITTEE**

<b>#</b>	<b>Name and Address</b>	<b>Position</b>
1.	Shri. Sanjiv Goenka Chairman, BOG, IIT Kharagpur & Vice-Chairman, RPG Enterprises CESC House, Chowringhee Square Kolkata – 700 001	Chairman
2.	Smt. Shanta Ghosh (Upto 10.10.2006) Managing Director Developments Consultants Ltd. (DCL) 24B, Park Street Kolkata – 700 016	Member
3.	Shri Roopen Roy (From 11.10.2006) Managing Director Deloitte & Touche Consulting India Pvt. Ltd. Bengal Intelligent Park Building Alpha 1 <sup>st</sup> Floor, Plot No.A2 M2 & N2 Block-EP & GP Sector-V Salt lake Electronics Complex Kolkata – 700 091	Member
4.	Shri Sanat Kumar Ray Financial Adviser & Joint Secretary Ministry of HRD, Government of India Department of Higher Education Shastri Bhawan New Delhi – 110 001	Member
5.	Shri Ravi Mathur Joint Secretary (T) Ministry of HRD, Government of India Department of Higher Education, TS-I Shastri Bhawan New Delhi – 110 001	Member
6.	Prof. S. K. Dube (Upto 30.06.2007) Director IIT Kharagpur – 721 302	Member
7.	Prof. D. Acharya (From AN of 30.06.2007) Director IIT Kharagpur – 721 302	Member
8.	Prof. M. Chakraborty Department Metallurgical & Materials Engineering IIT Kharagpur – 721 302	Member
9.	Dr. D. Gunasekaran Registrar IIT Kharagpur – 721 302	Secretary

## **BUILDING AND WORKS COMMITTEE**

<b>#</b>	<b>Name and Address</b>	<b>Position</b>
1.	Prof. S.K. Dube (Upto 30.06.2007) Director IIT Kharagpur – 721 302	Chairman
2.	Prof. D. Acharya (From AN of 30.06.2007) Director IIT Kharagpur – 721 302	Chairman
3.	Director (T) Ministry of Human Resource Development Government of India Department of Higher Education (TS.I) Shastri Bhawan New Delhi – 110 001	Member
4.	Shri D. K. Mitra Superintending Engineer & Circle Manager Midnapore Distribution Circle West Bengal State Electricity Board Paschim Medinipur	Member
5.	Shri Shankar Chakraborty Superintending Engineer South Western Circle Public Works Department (PWD) Paschim Medinipur	Member
6.	Head Department of Civil Engineering IIT Kharagpur – 721 302	Member
7.	Head Department of Electrical Engineering IIT Kharagpur – 721 302	Member
8.	Head Department of Architecture & Regional Planning IIT Kharagpur – 721 302	Member
9.	Dr. D. Gunasekaran Registrar IIT Kharagpur – 721 302	Secretary

## LIST OF ADMINISTRATIVE HEADS

Director	Prof. S. K. Dube Prof. Damodar Acharya	Upto From	30.06.2007 30.06.2007
Deputy Director	Prof. V. R. Kalvey Prof. M. Chakraborty	Upto From	31.08.2006 01.09.2006
<b>Deans</b>			
Undergraduate Studies	Prof. R. V. Rajakumar Prof. B. S. Sastry	Upto From	31.08.2006 01.09.2006
Faculty & Planning	Prof. R. N. Datta		
Postgraduate Studies & Research	Prof. S. K. Satsangi		
Sponsored Research & Industrial Consultancy	Prof. P. P. Chakrabarti		
Students' Affair	Prof. V. R. Kalvey Prof. H. R. Tewari	Upto From	31.08.2006 01.09.2006
Continuing Education	Prof. Bani Chatterjee		
Alumni Affairs & International Relations	Prof. M. Chakraborty Prof. Ajay Chakrabarty	Upto From	31.08.2006 01.09.2006
Vinod Gupta School of Management	Prof. Probir Kumar Gupta		
<b>Head of Departments</b>			
Aerospace Engineering	Prof. P. K. Datta		
Agricultural & Food Engineering	Prof. B. C. Mal		
Architecture & Regional Planning	Prof. U. K. Banerjee		
Biotechnology	Prof. Satyahari Dey Prof. A. K. Ghosh	Upto From	31.08.2006 01.09.2006
Chemical Engineering	Prof. D. Mukherjee		
Chemistry	Prof. Amit Basak		
Civil Engineering	Prof. S. P. Dasgupta		
Computer Science & Engineering	Prof. Anupam Basu Prof. Indranil Sengupta	Upto From	10.04.2007 10.04.2007
Electrical Engineering	Prof. S. K. Das		
Electronics & Electrical	Prof. R. N. Pal	Upto	31.01.2007
Communication Engineering	Prof. Debasish Datta	From	01.02.2007
Geology & Geophysics	Prof. Biswajit Mishra Prof. A. K. Gupta	Upto From	31.08.2006 01.09.2006
Humanities & Social Sciences	Prof. Bani Chatterjee		
Industrial Engineering & Management	Prof. K. Vizayakumar Prof. P. K. Ray	Upto From	30.08.2006 01.09.2006
Mathematics	Prof. S. S. Alam		
Mechanical Engineering	Prof. S. K. Som		
Metallurgical & Materials Engineering	Prof. S. C. Panigrahi Prof. N. Chakraborti	Upto From	31.08.2006 01.09.2006
Mining Engineering	Prof. Ashis Bhattacharya Prof. K. U. M. Rao	Upto From	31.08.2006 01.09.2006

Ocean Engineering & Naval Architecture	Prof. Debabrata Sen
Physics & Meteorology	Prof. B. K. Mathur

#### Head of Centres

Centre for Oceans, Rivers, Atmosphere and Land Sciences	Prof. S. Tripathy Prof. S. K. Satsangi	Upto From	31.08.2006 01.09.2006
Computer & Informatics	Prof. Jayanta Mukhopadhyay Prof. Rajib Mall	Upto From	30.07.2007 30.07.2007
Cryogenic Engineering	Prof. Kanchan Chowdhury Prof. V. V. Rao	Upto From	31.08.2006 01.09.2006
Material Science Reliability Engineering Rubber Technology Rural Development	Prof. C. K. Das Prof. R. B. Misra Prof. A. K. Bhowmick Prof. P. B. S. Bhadoria Prof. S. Prasad Prof. H R Tewari	Upto 01.09.06 From	31.08.2006 31.10.2006 01.11.2006
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. Majumdar Prof. A. K. Ray	Upto From	31.08.2006 01.09.2006
Vinod Gupta School of Management	Prof. Probir Kumar Gupta		
Rajiv Gandhi School of Intellectual Property Law	Prof. S. Tripathy	From	02.01.2007

#### Chairmen & Vice-Chairmen

UG Admissions	Prof. A. K. Ghosh		
Vice-Chairman, UG Admissions	Prof. A. N. Samanta		
PG Admissions	Prof. Souvik Chatterjee		
Vice-Chairman, PG Admissions	Prof. O. P. Sha		
JAM	Prof. J. K. Ray		
Vice-Chairman, JAM	Prof. M. P. Bishal		
Central Library	Prof. S. S. Bandyopadhyay		
Hall Management Committee	Prof. H. N. Mishra		
Chairman, CWIS	Prof. P. K. Das		
Central Research Facility	Prof. B. K. Dhindaw Prof. Indraniil Manna	Upto From	30.11.2006 01.12.2006
Post Harvest Technology Centre	Prof. Suresh Prasad Prof. H. N. Mishra	Upto From	31.08.2006 01.09.2006
Educational Technology	Prof. T. K. Basu		

Optel-IIT Centre	Prof. B. K. Dhindaw Prof. Indranil Manna	Upto From	30.11.2006 01.12.2006
Rajbhasha Vibhag	Head, HSS Prof. H. R. Tewari	Upto From	31.08.2006 01.09.2006
Nehru Museum of Science & Technology	Prof. P K Das Prof. D. Sen	Upto From	31.08.2006 01.09.2006
Kalpana Chaola Space Technology Cell (KCSTC)	Prof. Ajoy Chakraborty Prof. Somnath Sengupta	Upto From	31.08.2006 01.09.2006
Advanced Technology Centre (ATC)	Prof. Santiram Kal		

### Professors-in-Charge

Examinations	Prof. Alok Barua Prof. S.K. Bhattacharyya	From	20.04.2007
Training & Placement	Prof. Gautam Sinha		
General Time Table	Prof. B. Mahanty		
Convocation	Prof. S. K. Satsangi		For 2007
Institute Information Cell	Prof. B. K. Mathur		
President, Technology Students	Prof. N. S. Raghuwanshi		
Gymkhana			
Refrigeration & Air Conditioning	Prof. Ramgopal Maddali		
Horticulture	Prof. S. C. Kundu		
Water Works	Prof. S. N. Panda		
Civil Works (Construction)	Prof. J. Barman		
Civil Works (Maintenance)	Prof. Arif N. Merchant		
Electrical Works	Prof. N. K. Kishore		
Telecommunication	Prof. S. S. Pathak		
Institute Guest Houses	Prof. B. K. Sengupta		
Intellectual Property Right & Industrial Relation	Prof. S. Tripathy		

### General

Registrar	Dr. D. Gunasekaran		
Public Relation Officer	Shri A. K. Kanojia	Upto	11.03.2007
Head, B.C. Roy Technology Hospital	Dr. (Mrs.) Seema Roy		
Superintending Engineer (Civil)	Shri T. K. Mukherjee		
Executive Engineer (Civil)	Shri Subrat Roy		
Executive Engineer (Horticulture)	Shri A. K. Ganguly	Upto	30.04.2007

### Deputy Registrars

Establishment	Dr. T. K. Ghosal		
Academic	Shri S. Sen		
Finance & Accounts	Shri A. P. Trivedi		
Stores & Purchase	Shri B. K. Basu Roychowdhury	Upto	25.07.2006
Rajiv Gandhi School of Intellectual Property Law	Shri B. K. Basu Roychowdhury	From	25.07.2006

## THE SENATE

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

Deputy Director Prof. V. R. Kalvey (Upto 31.08.2006)  
Prof. .M. Chakraborty (From 01.09.2006)

### **Aerospace Engineering Department**

Prof. A. K. Ghosh  
Prof. P. K. Datta  
Prof. G. Bandyopadhyay  
Prof. Navtej Singh

Prof. Dibyendu Mukherjee  
Prof. Amar Nath Samanta  
Prof. Sunando Dasgupta  
Prof. N. C. Pradhan  
Prof. Sirshendu De

### **Agricultural Food Engineering Department**

Prof. H. Das – Retired on 28.02.2007  
Prof. K. P. Pandey  
Prof. S. Bal – Retired on 31.07.2006  
Prof. S. Prasad – Retired on 31.10.2006  
Prof. Bimal Ch. Mal  
Prof. R. Singh  
Prof. V. K. Tewari  
Prof. K. N. Tiwari  
Prof. R. K. Panda  
Prof. Rintu Banerjee  
Prof. S. K. Das  
Prof. B. C. Ghosh  
Prof. P. B. S. Bhadoria  
Prof. Ashis Kr. Dutta  
Prof. H. N. Mishra  
Prof. N. S. Raghuwanshi  
Prof. S. N. Panda  
Prof. T. K. Goswami

### **Chemistry Department**

Prof. P. Pramanik  
Prof. T. K. Sarkar  
Prof. J. K. Ray  
Prof. P. K. Chattaraj  
Prof. Sujit Roy  
Prof. Tanmaya Pathak  
Prof. Tarasankar Pal  
Prof. Amit Basak  
Prof. Dipakranjan Mal  
Prof. Debashis Ray  
Prof. Manish Bhattacharjee  
Prof. S. K. Srivastava

### **Architecture & Regional Planning Department**

Prof. R. N. Datta  
Prof. Mridula Banerji – Retired on 31.01.2007  
Prof. Biplab Kr. Sengupta  
Prof. U. K. Banerjee  
Prof. Arif. N. Merchant

### **Civil Engineering Department**

Prof. J. N. Bandyopadhyay  
Prof. Deba Prasad Ghosh  
Prof. S. P. Dasgupta  
Prof. M. Mazumdar – Retired on 28.02.2007  
Prof. S. K. Bhattacharyya  
Prof. K. S. Reddy  
Prof. L. S. Ramachandra  
Prof. S. Dey

### **Biotechnology Department**

Prof. S. C. Kundu  
Prof. D. Das  
Prof. S. H. Dey  
Prof. Ananta Kumar Ghosh  
Prof. Amit Kumar Das

### **Computer Science & Engineering Department**

Prof. A. Pal  
Prof. A. K. Majumdar  
Prof. S. Ghose  
Prof. P. P. Chakraborty  
Prof. A. Basu  
Prof. Indranil Sengupta  
Prof. Jayanta Mukhopadhyay  
Prof. S. P. Pal  
Prof. Rajib Mall  
Prof. Depankar Sarkar  
Prof. Dipanwita Roy Chowdhury  
Prof. Pallab Dasgupta

### **Chemical Engineering Department**

Prof. R. K. Saha – Retired on 28.02.2007



Prof. Rajeev Kumar  
Prof. Sudeshna Sarkar

#### **Cryogenic Engineering Centre**

Prof. S. K. Sarangi  
Prof. S. S. Bandyopadhyay  
Prof. V. R. Kalvey – Retired on 31.08.07  
Prof. T. K. Dey  
Prof. V. Rao Vutukuru  
Prof. Kanchan Chowdhury

#### **Educational Technology Centre**

Prof. T. K. Basu (EE)

#### **Electrical Engineering Department**

Prof. T. K. Basu  
Prof. S. K. Das  
Prof. A. K. Sinha  
Prof. J. 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 Kr. Dutta  
Prof. B. M. Mohan  
Prof. Debapriya Das  
Prof. Sabyasachi Sengupta  
Prof. T. K. Bhattacharya

#### **Electronics & Electrical Communication Engineering Department**

Prof. R. Garg  
Prof. R. Gangopadhyay – Retired on 30.09.2006  
Prof. R. N. Pal – Retired on 31.01.2007  
Prof. A. Chakraborty  
Prof. D. Dutta  
Prof. Ajoy Kr. Roy  
Prof. Swapna Banerjee  
Prof. C. K. Maiti  
Prof. S. Kal  
Prof. V. R. K. Ratnam  
Prof. J. C. Biswas – Retired on 31.01.2007  
Prof. Prabir Kr. Biswas  
Prof. Somnath Sengupta  
Prof. Mrityunjoy Chakraborty  
Prof. Sant Sharan Pathak  
Prof. Subrata Sanyal

#### **Geology & Geophysics Department**

Prof. S. K. Nath  
Prof. Biswajit Mishra  
Prof. Anil Kumar Gupta  
Prof. D. Sengupta  
Prof. Abhijit Bhattacharya  
Prof. S. Tripathy  
Prof. Anindya Sarkar  
Prof. Subhasish Das

#### **Humanities & Social Sciences Department**

Prof. (Ms.) B. Chatterjee  
Prof. Partha Basu  
Prof. H. R. Tewari  
Prof. M. K. Mandal  
Prof. Damodar Suar  
Prof. Anjali Gera Ray  
Prof. K.B.L. Srivastava  
Prof. Suhita Chopra Chatterjee

#### **Industrial Engineering & Management Department**

Prof. P. K. J. Mahapatra  
Prof. R. N. Banerjee  
Prof. S. Sahu  
Prof. S. Srinivasan  
Prof. K. Vizaykumar – VRS on 31.08.2006  
Prof. Biswajit Mahanty  
Prof. Pradip Kr. Ray

#### **Reliability Engineering Centre**

Prof. R. B. Mishra

#### **Materials Science Centre**

Prof. Ajit Kr. Banthia  
Prof. D. Bhattacharya  
Prof. C. K. Das  
Prof. B. Adhikari  
Prof. Shankar Ram

#### **Mathematics Department**

Prof. S. Nanda – On lien 04.03.2005 to 03.03.2008  
Prof. S. S. Alam  
Prof. A. R. Roy  
Prof. P. D. Srivastava  
Prof. A. Sarkar  
Prof. U. C. Gupta  
Prof. M. P. Biswal  
Prof. D. K. Gupta  
Prof. V. K. Jain

Prof. S. Bhattacharyya  
Prof. A. Goswami  
Prof. Somesh Kumar

#### **Mechanical Engineering Department**

Prof. A. Mukherjee  
Prof. B. Pradhan  
Prof. P. K. Mishra – VRS on 31.07.2007  
Prof. S. K. Som  
Prof. V. V. Satyamurthy  
Prof. Ranjit Karmakar  
Prof. S. K. Roy Chowdhury  
Prof. R. K. Brahma  
Prof. A. K. Chattopadhyay  
Prof. S. Bhattacharyya  
Prof. R. Bhattacharyya  
Prof. S. K. Dash  
Prof. A. S. Sekhar  
Prof. P. K. Das  
Prof. A. R. Mohanty  
Prof. S. N. Bhattacharyya  
Prof. R. N. Maiti  
Prof. B. Maiti  
Prof. S. Paul

#### **Metallurgical & Materials Engineering Department**

Prof. B. K. Dhindaw – Retired on 30.11.2006  
Prof. M. Chakraborty  
Prof. S. K. Pabi  
Prof. Sanat Kr. Roy  
Prof. M. M. Godkhindi  
Prof. K. K. Ray  
Prof. S. C. Panigrahi  
Prof. N. Chakraborty  
Prof. Indraniil Manna  
Prof. Siddhartha Das

#### **Mining Engineering Department**

Prof. S. S. Bhamidipati  
Prof. A. Bhattacharyya  
Prof. K. U. M. Rao  
Prof. Samir Kr. Das  
Prof. Khanindra Pathak  
Prof. Jayanta Bhattacharyya  
Prof. S. K. Mukhopadhyay

#### **Ocean Engineering & Naval Architecture Department**

Prof. S. C. Misra  
Prof. S. Satsangi  
Prof. N. R. Mandal  
Prof. D. Sen

Prof. Om Prakash Sha

#### **Physics & Meteorology Department**

Prof. S. K. Ghatak  
Prof. R. N. Prasad Choudhary  
Prof. Naresh Chandra  
Prof. B. K. Mathur  
Prof. B. Samantaray  
Prof. S. L. Sharma  
Prof. A. Chandrasekar  
Prof. Srinivas Veeturi  
Prof. Samit Kr. Ray  
Prof. A. Taraphder  
Prof. Krishna Kumar  
Prof. P. K. Raina

#### **Rubber Technology Centre**

Prof. A. K. Bhowmick  
Prof. D. K. Tripathy  
Prof. G. B. Nando  
Prof. D. Khastagir  
Prof. Tapan Kumar Chaki

#### **Rural Development Centre**

Prof. H. R. Tewari (HSS)

#### **Vinod Gupta School of Management**

Prof. K. K. Guin  
Prof. Gautam Sinha

#### **G. S. Sanyal School of Telecommunications**

Prof. Saswat Chakrabarti

#### **Nominated Members**

Prof. P. K. Gupta, Dean, VGSOM

#### **Secretary (Registrar)**

Dr. D. Gunasekaran

#### **Students Representative**

Sri Deepak Rathee (Roll No. : 03IM3007)  
Sri Saurabh Maheshwari  
(Roll No.: 03AG1010)  
Sri Bipin Kumar Dixit (Roll No. : 05AG6601)  
Sri Vivek Shrivastava (Roll No. : 04RE9701)

## 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 academic year 2006 –2007. Brief outlines of the major activities of the Institute during the academic year are highlighted.

### ACADEMIC PROGRAMS

The Institute has been very sensitive to the human resource development of the country and to that end continues initiating new academic programs. In the last academic year two new M. Tech programs have been introduced, one in Earth System Science and Technology and the other in Media and Sound Engineering. PG Diplomas in Telecommunication network planning and management, and Intellectual Property Law have also been started. A unique three-year program of Bachelor of Law with specialization in Intellectual Property Rights has been introduced, as there is a growing need to protect intellectual property generated in the country. To provide more specialization options for the undergraduate students the Institute is now offering 39 Dual Degree Programs in Departments, which offer multiple M.Tech specialization programs. All Dual Degree programs of the Institute include the major B.Tech degree along with the chosen M.Tech specialization. From this year a new M.Tech program in Medical Imaging & Image Analysis and a new Postgraduate Diploma in Rural Development are being introduced.

The Institute has created an Advanced Technology Development Centre to promote inter-disciplinary academic activities of Microelectronics Laboratory, MEMS and Nanotechnology, Microscience Laboratory, Advanced VLSI Lab, Communication Empowerment Lab, Centre for Theoretical Studies, Kalpana Chawla Space Technology Cell and Optel-IIT Fibre Optics R & D Centre.

The Institute is preparing a perspective plan for increasing the number of student intake. Accordingly, all facilities and infrastructure are being upgraded as per the plan. In the Academic year 2006-2007, the Institute has increased its student intake by 34 percent in respect of the previous year. This has been effectuated by 29 percent increase in undergraduate students intake and 40 percent increase in postgraduate students and research scholars. 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, nineteen Dual Degree programs, Integrated M.Sc. programs in seven science streams, six two-year M.Sc. programs, forty-nine postgraduate degree courses leading to M.Tech/MCP/MBM/MMST degrees and eight postgraduate diploma courses. The contents of these courses are constantly revised to meet the needs of the changing world with focus on quality and excellence.

The Ministry of Steel, Government of India has decided to set up a Steel Research Centre in the Institute for encouraging education in iron and steel making so that the country can cope up with the manpower requirements of steel industry, which is expected to produce about 120 million of tones of steel by the year 2020.

### CONVOCATION

Fifty-second Convocation of the Institute was held on 15th July 2006. Shri Arun Sarin, CEO, Vodafone Group Plc. was the Chief Guest. In the convocation 84 Ph.D., 11 MS, 452 M.Tech. 17 MCP, 85 MBM, 123 Dual Degree, 8 MMST, 73 PGDIT, 6 PGDMOM, 35 PGDBM, 17 PGDST, 15 PGDM, 128 M.Sc 304 B.Tech (Hons) and 12 B.Arch (Hons) degrees were conferred. Shri Shambaditya Saha of the Department of Biotechnology 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 Seth Siddhartha Sunil Kumar 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 S. Narayanan 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 Paonam Santosh Kumar Singh of Department of Electronics and Electrical Communication Engineering. Shri Sayantan Sharma of 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 Amit Ray of Department of Naval Architecture 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 52nd Convocation, to recognize the significant contributions of eminent individuals, alumni and well-wishers, the Senate and the Board of Governors of the Institute conferred Life Fellow of IIT Kharagpur Award and Distinguished Alumnus Awards. The Life Fellow of IIT Kharagpur Award – 2006 was conferred on Professor G. S. Sanyal, Ex Director of this Institute. Distinguished Alumnus Awards were conferred on Dr. Asit Kumar Biswas, President, Third World Centre for Water Management, Atizapan, Mexico; Shri Ravinder Nath Khanna, Founder & Chairman-cum-Managing Director of Controls & Switchgear Group of Companies, New Delhi; Dr. Alevor Raghupathy Upadhyaya, Director, National Aerospace Laboratories, Bangalore; Shri Arun Sarin, Chief Executive Officer, Vodafone Group Plc, UK and Dr. Pradeep K. Khosla, Dean, College of Engineering, Carnegie Mellon University, Pittsburgh, USA.

## RESEARCH AND DEVELOPMENT ACTIVITIES

Research and development activities go hand in hand with the Institute's pursuit of academic excellence. >From its earliest days two definite overlapping themes guided IIT Kharagpur's research quest – '*cutting edge*' and '*India centric*'. The Institute's Departments, Centres and R&D laboratories continue to carry out research and development in a number of unique areas.

An advanced Tea Engineering Research Centre is being established in the Institute with financial support from Ministry of Commerce, Government of India that will facilitate research activities on mechanical aids for plantation, new machine design for processing of tea, product diversification and new derivatives. The same ministry has also approved a Coffee Research Centre in the Institute.

The R&D activities of Aerospace Engineering encompass smart composite structures, functionally graded materials, analysis of multidirectional smart piezo-fibre reinforced composite, analysis of composite ISO-Grid structure, analysis of nano-composite, computational aero-acoustics, flow-induced vibration and fluid-structure interaction, aerodynamics of thunderstorm downburst. Agricultural and Food Engineering Department is pursuing research on precision agriculture, food processing and agricultural biotechnology. The major areas of current research and development in the Department of Architecture and Regional Planning are in the areas of planning informatics, building automation and management systems, conservation and preservation studies, design simulation and intelligent architecture, disaster mitigation and management, eco-tourism, recreation and landscape planning, geographical information systems, graphic design and visual communication, transportation planning, sustainable development and housing and shelter.

The Department of Biotechnology is carrying out researches on Molecular farming of therapeutic & diagnostic Proteins, bioremediation, recombinant proteins / Bio hydrogen / Bio surfactant production in bioreactors and Genomics. The Department of Chemistry has undertaken research for the preparation of semi-conducting nano-rods, nano-tubes, nano-wires and thin films for thermoelectric and opto-electronic applications. The Department is also carrying out research on layered inorganic materials. The frontier research programs in the Department of Chemical Engineering are oriented towards flue gas conditioning, hydrogen generation in micro-reactor, polymer composites and hazardous waste treatment.

The Civil Engineering Department is involved in low-cost road construction, bridge scour estimation, multi-scale modeling of small scale interfacial phenomena in carbon nano-tube reinforced

composites, bioelectricity generation and self-compacting concrete using recycled concrete aggregate. The R&D activities of Computer Science and Engineering Department span in areas such as VLSI design, verification, testing and CAD tools, artificial intelligence, speech and natural language processing, security and cryptography, Multimedia Systems, Telemedicine and Medical Informatics. The Cryogenic Engineering Center has concentrated on new processes for processing and purification of natural gas and hydrogen, air breathing propulsion, non-conventional energy, nano-fluids and bio-composites, materials for magnetic refrigeration and superconducting magnets for nuclear fusion. The Centre for Ocean, River, Atmosphere & Land (CORAL) is carrying out researches on observations and modeling of severe thunderstorms; global and regional climate modeling and modeling of extreme events like tsunami, cyclone and storm surges.

The Electrical Engineering Department has been carrying out research on modeling, identification and robust control of linear / non-linear / hybrid / periodic systems; stability, quality and efficiency of power generation, transmission and distribution; real-time, embedded signal processing and control of industrial systems. The Department of Electronics and Electrical Communication Engineering is currently engaged in researches on wireless communication, wireless sensor networks, optical communications and networking, computer networking, signal, image and video processing, VLSI design and advanced semiconductor devices and RF and microwave engineering.

The Department of Geology and Geophysics has been carrying out studies on evolution of the Indian continental lithosphere through time and metallogeny; ancient life forms, paleo-environment, paleo-climate and paleo-monsoon; earthquake seismology, seismic and other natural hazards. The Department of Humanities and Social Sciences is involved in the estimation of agricultural growth and its decomposition along with the effect of rainfall, philosophy of mind and applied ethics. The Department of Industrial Engineering and Management is carrying out investigations in the areas of soft computing and its application, supply chain management, e-business, operations management and work system design.

The Materials Science Center has devoted itself to research in biomedical polymers, biosensors and innovative processing methods. During the last year, the Department of Mathematics was involved in carrying out researches in diverse areas of pure and applied mathematics, statistics and OR and theoretical computer science. The Department of Mechanical Engineering is actively involved in the researches on composite and smart structures, biomechanics, micro-fluidics and micro-scale transport processes, laser processing of materials, high speed grinding, CFD and combustion modeling.

The research activities of the Department of Metallurgical and Materials Engineering encompass broad areas such as synthesis, characterization and fabrication of Al-based nano-intermetallic dispersed amorphous alloy, grain refinement of aluminium and its alloys, in-situ Al alloy based metal matrix composites, nano-fluid for advanced heat transfer application, nano-structured coating for tribological application and Ti-Ni shape memory alloys for biomedical applications. The Mining Engineering Department has concentrated on Rock Mechanics and Ground control, Environmental safety, Planning and Systems Study. The research activities currently pursued in the Department of Ocean Engineering and Naval Architecture are in the areas of marine hydrodynamics and oceanography; marine and ocean structures and marine design and production. The Department of Physics and Meteorology is engaged in research activities on condensed matter at nano-scale, photonics and biophysics.

The Reliability Engineering Center is concerned with reliability analysis of one-shot devices, software reliability and maintenance engineering. The research activities of the Rubber Technology Center are oriented towards nano-composites, polymer composites for electrical and electronic applications and modification of polymers by electron beam irradiation technique, polymer binding and polymer recycling. The Rajiv Gandhi School of Intellectual Property Law is involved in research activities concerning Intellectual property-law and practice, technology management and legal system and intellectual property related issues and human rights. The Rural Development Center is involved in transfer of technology to rural areas and socio-economic studies pertaining to rural development.

The Center for Educational Technology is involved in pedagogical research, multilingual content development, e-learning and accessible video lectures through the Internet.

The G. S. Sanyal School of Telecommunications is presently involved in channel estimation and equalization method for OFDM, turbo equalization in mobile broad-band channels, multi-user detection, video signal processing for wireless transmission, biomedical signal processing and telemetry. The School of Information Technology is carrying out researches in the areas of information security, ubiquitous computing research and GIS. The School of Medical Science and Technology is carrying out research in medical imaging and analysis, technology in reproductive health and bio-markers development and applications in oncology. The research and development activities in the Vinod Gupta School of Management are in the areas of on-line buying behaviour and quality management systems.

Advanced Technology Development Centre (ATDC), an academic umbrella of all interdisciplinary research cells and advanced laboratories of the Institute is involving researchers from various disciplines like Electronics, Communication, Electrical Engineering, Mechanical Engineering, Civil Engineering, Biotechnology, Materials Science, Physics, Chemistry and Life Science to work in advanced and frontier areas of science and technology, namely, microelectronics, MEMS, nanotechnology, advanced VLSI design, space technology, communication empowerment for disables, plants and genetic engineering. Research emphasis has been given to design and prototype fabrication of ASICs, MEMS devices, smart sensors for different strategic applications in the country as well as for the global needs. MEMS group of ATDC is also participating in Pico-Satellite program of ISRO. Recently under Indo-Italy research collaboration program, IIT Kharagpur has developed micro-systems using micro-accelerometer for automobile pollution control and protection of environment. Major R&D focus has now been directed in the area of MEMS for biomedical applications such as adaptive drug delivery system, lab-on-a-chip, DNA hybridization, cell immobilization and culture, and micro-fluidic devices. ATDC is actively collaborating with US universities like University of Illinois Urbana-Champaign, University of California-Irvine and North Western University in the areas of Bio-MEMS, advanced and futuristic micro-manufacturing. A MEMS research hub has also been proposed to set up at IIT Kharagpur in collaboration with Italian research institutions to further strengthen R&D activities on Bio-MEMS.

## **INFRASTRUCTURE DEVELOPMENT**

In order to cope with the rapid advances in science and technology, the infrastructure and experimental facilities require constant modernization. During the year, several new facilities have been acquired and installed.

The Department of Aerospace Engineering has developed an intelligent systems laboratory, upgraded its Instron Testing Machine with 8800 series controller and acquired a Vishay signal conditioner, Labview software and NI data acquisition system and free surface water table facility. In the Agricultural and Food Engineering Department aeration and water supply system for aquaculture and nano-pure water purification system have been installed. In the Department of Architecture and Regional Planning a design simulation laboratory has been developed and the graphics and visual communication laboratory, the environment laboratory has been upgraded with high-end computer terminals and state-of-the-art instruments. The Department of Biotechnology has installed a pilot plant for bio-hydrogen production, procured shaker incubator, acta prima gel filtration system, bioreactor for animal cell culture and is developing animal cell culture facilities—III with CO<sub>2</sub> incubator, laminar hood, inverted microscope. In the Department of Chemistry a new Raman Spectrometer has been installed. For the first year chemistry laboratory, two FT-IR spectrometers are also procured. The Department of Chemical Engineering has procured micro reactor, six axes filament winding machine, UV Spectrophotometer, gas chromatograph, thermal conductivity meter and compression moulding machine. In the Civil Engineering Department, a 600 kN, Static Universal Testing Machine and a high speed camera with a speed of 210 frames per second have been installed. In the Centre for Ocean, River, Atmosphere & Land (CORAL), a 50-meter instrumented micro-meteorological tower is being installed and a deep computation and visualization laboratory has been established. The Cryogenic Engineering Center has developed experimental facilities for VLE measurement at

vacuum and high pressure, also for online thermo-physical measurements of nano-fluids and bio-composites and enhanced the measurement capabilities of the cryogen free magnetic field central facility. The Center has acquired spin coater for thick film deposition. In the Electrical Engineering Department, a new electrical technology laboratory for first year students and a real-time embedded system laboratory have been created.

The Department of Electronics and Electrical Communication Engineering has procured video conferencing kit, IEEE 1394 Frame Grabber and Basler digital camera, FPGA based DSP in VLSI trainer kits, Benchmark LAN trainer kit and Falcon Mobile Telephony Communication trainer kit. The G. S. Sanyal School of Telecommunications has acquired System Studio Z software. In the Department of Humanities and Social Sciences, a new language communication and multimedia laboratory has been established. The Department of Industrial Engineering and Management has developed ergonomics and human factor engineering laboratory. The Department has acquired thermal comfort data logger and installed Wi-Fi network based real-time location system. The Department of Mathematics has setup a new statistics and informatics laboratory. In the Department of Mechanical Engineering, an indigenously designed knee joint simulator has been fabricated for designing and testing knee implants. The Materials Science Centre has acquired hot stage polarized microscope, differential scanning calorimeter, Thermo-gravimetry Analysis and Differential Thermal Analysis Instruments. The Metallurgical and Materials Engineering Department has acquired a field emission scanning electron microscope, 30-ton cold compaction press, thermo-mechanical processing unit, LCR-Z impedance analyzer and spray casting setup.

The Department of Mining Engineering has acquired Spirometer, Anthropometer, Trademill and Respirable Dust Sampler. The Department of Ocean Engineering and Naval Architecture has installed a wave-maker facility for training and research activities. The Reliability Engineering Center has installed thermal shock and burn-in test chambers funded by DST. The Rubber Technology Center has acquired Rubber Process Analyzer-2000 and Air circulating ageing oven. In School of Information Technology, a cell for excellence in information assurance has been set up. The School of Medical Science & Technology has acquired a Picture Archival & Communication System, Medical Macro & Micro Imaging devices, like Ultrasonograph, Color Doppler, Digital CR, Atomic Force Microscope, Fluorescence Microscope, Optical Microscope, Scanning Electron Microscope, PEM and Gel Documentation System.

Field Emission Scanning Electron Microscope, Panalytical Pro X-Ray Diffractometer and Pyris Diamond Thermal Mechanical Analyser are installed as part of the Central Research Facility. The Central Library has enhanced its digital library facilities by acquiring Springer e-books collection including all publications published by the company, Journal Archives of Royal Society of Chemistry and six nature group journals. The Computer and Informatics Center has procured comprehensive anti virus solution for securing the desktop machines and server from viruses, spy wares and SPAM mails. Institute has also procured its own IPV4 address space from Asia Pacific Network Information Center, which will be used for online journal subscription, DNS and web services. The Central Workshop and Instruments Service Section of the Institute has procured a LPKF PCB Prototyping Machine.

## **CAMPUS INFRASTRUCTURE**

The Institute's continuously growing campus needs constant revamping and augmentation of facilities. To this end, the Institute has taken several actions. The Institute is in the process of preparing a campus master plan in terms of the infrastructure and other requirement to cater to the growth. Steps have been taken to build a new Undergraduate Lab Complex, a Class-room Complex and Lal Bahadur Shastri Hall of Residence for accommodating 2000-students on a priority basis. The construction of Rani Laxmibai Hall of Residence, for girl students is heading towards completion. Large-scale maintenance of existing faculty housing, students' halls of residence and community market is in progress. The work for Rajiv Gandhi School of Intellectual Property Law building is progressing steadily. The construction of a 100-bed capacity Institute Guest House has started to meet the Institute's long-standing needs specially felt during symposia, seminars and major Institute functions. Construction of annex building and vertical expansion of existing building is in progress at

IIT Kharagpur Calcutta Extension Center to cater to the Institute's growing demand for extension programs. The entire stretch of the boundary wall of the campus has been completed ensuring greater security for the campus. In order to provide uninterrupted and quality electric power in the campus, the entire 11 kV distribution system and 400 V low voltage lines have been converted from overhead lines to underground cables. Augmentations of the receiving and distribution substations are also being carried out.

## **INTERNATIONAL COLLABORATION**

Accelerated progress in many of the Institute's endeavours is possible only through active collaborations. The Institute has several collaborations in different areas of research and development. The Department of Aerospace Engineering is in the process of completing the agreement with School of Aerospace, Naval Architecture and Ocean Engineering, Chosun University, Korea. The Department is also in the process of developing collaborations with Department of Systems and Mechanical Engineering, Ryokoku University, Japan and Department of Aerospace Engineering of Politecnico di Milano, Italy. The Architecture and Regional Planning Department is continuing collaborations with Technical University Munich, Germany on academic and technical affairs. Faculty members from the Department of Biotechnology have established collaborative research works with the Swiss Federal Institute of Technology, Switzerland, Tufts University, USA, School of Biomedical Engineering, University of New South Wales, Australia, Ruhe University, Germany and Technical University, Denmark. The Department of Computer Science and Engineering has on-going collaborations with Intel, National Semiconductors, Synopsis, Microsoft, General Motors, Orrick and EXC. Indo-Swiss project between Computer Science and Engineering Department and EPFL, Switzerland has been going on in the field of formal verification. The Department is also involved in the Indo-German Project between the Institute and T.U. Dresden.

The Department of Geology and Geophysics has collaborations with the Universities of Heidelberg, Bonn and Free, Germany; University of Cambridge, UK; National Oceanic and Atmospheric Administration, USA. The faculty members of Mathematics Department are collaborating with University of Birmingham, UK; Bolya University, Romania; University of Arizona, USA; University of Science & Technology, China and University Miguel Hernandez, Spain for carrying out researches in diverse areas of mathematics.

The Department of Mechanical Engineering is involved in a Indo-South African Programme of Cooperation in Science & Technology in the area of Machine Tool Vibration Monitoring. The Department of Metallurgical and Materials Engineering is involved in an Indo-Polish collaborative research on Synthesis and Characterization of Nano-crystalline Composites and in Indo-US collaborative research on High-Speed Laser Synthesis. The Department is also involved with the Brunel University, UK for conducting research in the field of semi-solid processing. In the Mining Engineering Department, a collaborative study is in progress with the French National Institute for Health and Medical Research, France to assess the relationships of individual characteristics and workplace hazards to occupational injuries in coalmines. The Department is also collaborating with Korean Institute of Geo-science and Mineral Resources (KIGAM) and SHELL International & Exploration BV. The Netherlands Reliability Engineering Centre has collaborations with DAV Norway. Rajiv Gandhi School of Intellectual Property Law is collaborating with George Washington University, USA. Vinod Gupta School of Management is collaborating with University of Nebraska, USA for students exchange programs.

The Institute has signed MOU with the Ministry of Defense, Government of India; Ministry of Earth Sciences, Government of India; National Rural Roads Development Agency; Bhabha Atomic Research Centre, Trombay; Indian Institute of Science Education & Research, Kolkata; Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow and Universiti Teknologi Mara, Malaysia. The Institute has also signed an MOU with University of Fukui, Japan for academic collaboration and research in the area of Medical Science & Technology.



## **SPONSORED RESEARCH AND INDUSTRIAL CONSULTANCY**

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 this 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 solutions.

IIT Kharagpur has unique expertise in advanced chip design and CAD for VLSI and MEMS. This institute is considered among the best worldwide in the area of CAD for VLSI, especially in niche areas like formal verification where it works hand in hand with a large international organizations. The MEMS group has made significant contributions to national research programs of ISRO and DRDO by development of advanced accelerometers, gyros and micro-valve. The area of micro-bio-fluidics and bio-nano-mems has become a thrust area of the institute with some significant development of new techniques for DNA hybridization.

This institute has produced among the first indigenous insect resistant Bt cotton. Green technology routes have produced unique protocols for jute on the one hand and bio-hydrogen on the other. 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 the unique male contraceptive, RISUG that is undergoing third phase of trials. Interdisciplinary research is being carried out in areas of non-invasive measurements, advanced image processing, 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. 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.

The areas of software development, planning, management, ERP and the like 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. ERP software for the Coal Sector has been developed and deployed in Coal India and other organizations.

During the last year, the Institute received 166 research projects for a total value of Rs. 440.7 million and 129 consultancy projects for Rs. 100.9 million. Thus a total of 295 sponsored projects were received during the year for total value of Rs. 541.6 million from Government, private and international funding agencies.

The Institute has initiated a number of projects that are expected to produce lasting long term national and international impact. These include a Tea Engineering Research Centre, supported by the Tea Board, a Centre for Excellence in Telecom, supported by Vodafone-Essar and DoT, an R&D Centre in the Power Sector, supported by DVC and a National EPMA Facility, supported by DST. In

addition, the Institute plans to promote three technology parks in the area of Biotechnology, Advanced IT and Energy in the vicinity of IIT Kharagpur.

The faculty, students and staff of this institute continuously strive their very best to achieve newer heights. All constructive criticism is received positively and with humility to help the Institute grow further. The support of the Institute's collaborators and well wishers towards continued research excellence is greatly appreciated.

### **STEP – IIT KHARAGPUR**

STEP IIT Kharagpur identifies itself as a single window arrangement for turning individuals with science and technology background into successful entrepreneurs capable of generating value added products. There are a total of 24 entrepreneurs operating from STEP, of which 4 are start-up companies. 900 sqm. of built up space has been added to the STEP office to accommodate additional entrepreneurs. The bio-diesel production plant has started producing bio-diesel from Jatropa oil for West Bengal Renewable Energy Development Agency.

STEP is actively participating in the incubation process of the entrepreneurs, specially the start up companies in preparing their business plans, getting seed capital followed by venture funding. STEP is also working towards translating some of the research outcomes of IIT faculty to commercially viable products and subsequently transfers the technology to the potential users. Technology for production of polyphenol from green tea leaves has been transferred to Rangpur Tea Association Ltd. Activities of STEP also include development of FRP roadside crash barriers for Indian National Highways, prototype development of interferential therapy set, ultrasonic therapy unit development and collaboration for development of e-recruitment solution for Indian Farmers Fertilizer Cooperative Limited. STEP has also organized training programme on Agri-clinic and Agri-business for agriculture graduates under the sponsorship of National Institute of Agriculture Extension Management.

### **CONFERENCES, SYMPOSIA, SEMINARS AND WORKSHOPS**

The Institute lays emphasis on knowledge dissemination, and encourages organization of conferences, symposia and workshops. The last year saw departments, centers and schools of the Institute organizing many such activities which attracted a large number of participants from India and abroad.

An international training program on Advanced Training in Agricultural Engineering for students and faculty of Tribhuvan University, Nepal was organized by the Department of Agriculture and Food Engineering Department. The department, jointly with the Rural Development Center, organized Krishi, Khadya O'Gramin Mela. The Department also conducted a workshop, ACOSINE-07, on Technologies for Rural Employment and Agriculture Cottage and small Industries Exposition. The Department of Architecture and Regional Planning has organized a short term course on earthquake risk management, aimed at capacity building of architects. The Department of Biotechnology organized a workshop on Bio-informatics in Genomics and Proteomics. The Chemical Engineering Department organized workshops, one on Introduction to Resin Transfer Moulding Technology and the other on Filament Winding Technology. The Department also organized a Biogas Entrepreneur's Training course and five construction-cum-maintenance training programmes. The Department also organized ChemInsIghT-2007 for students. The Department of Computer Science and Engineering conducted an international symposium on Algorithm and Computation and an international conference on Medical Information Technology. The Electrical Engineering Department organized international conferences on Industrial Technology and Numerical Linear Algebra in Signals, Systems and Control besides a seminar on Energy Conservation.

The Department of Industrial Engineering and Management conducted a workshop on Operational Research as Competitive Edge. The Department of Mathematics has organized a short-term course on Decision Making Tools in Engineering. The Department of Metallurgical and Materials Engineering held an International Conference on Solidification Science and Processing at Jaipur and

a Congress of Metallurgical Professionals. The Department of Physics and Meteorology organized a symposium on high-energy physics and the 14<sup>th</sup> national seminar on Ferroelectrics and Dielectrics. The Centre for Ocean, River, Atmosphere & Land (CORAL) organized a workshop on STORM Pilot Phase 2006 : Data Analysis and Modeling Results. The Reliability Engineering Center organized an international conference on Reliability and Safety Engineering. The Rural Development Center organized training programmes on Livelihood Generation in rural sector through transfer of appropriate technology, Research methodology for rural social science. In the School of Medical Science and Technology, a conference on Medical Informatics and Telemedicine has been organized. "Purvodaya", a conference on industrial resurgence of the eastern India and "Occasio", a business school students' competition were held in Vinod Gupta School of Management. The School also conducted two workshops on Stock Markets. The Central Library of the Institute organized National Conference on Information Management on Digital Libraries, besides twelve plenary lectures by eminent experts in the fields of Library and Information Science.

### **CONTINUING EDUCATION PROGRAM**

The Continuing Education Program 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. The activities include providing continuing education and training to professionals from industries – large and small, providing opportunities to teachers of Engineering Colleges to update their knowledge through short-term courses and pursuing M.Tech and Ph.D programs under the QIP. The Center also promotes teaching-learning resource materials in the form of printed texts, CDs and computer aided instruction packages.

During the last one year, with AICTE support, twenty one teachers from various engineering colleges have obtained their Doctoral degree and nineteen their Master's degree. Eighteen teachers have enrolled for the Ph.D. program and another eighteen teachers have taken advance admission to the Ph.D. program. Fourteen college teachers have joined the M.Tech. Program.

The Curriculum Development Cell of the CEP has funded the preparation of two textbooks. New approval for writing of five textbooks and one CAI package have been given. Nearly sixty-four self-supported short-term courses (on-campus as well as off-campus) have been conducted for professionals employed in industry and R&D organizations. 2237 participants were awarded Certificates on completion of the course works. In addition, nine QIP short-term courses and one Early Faculty Induction Program (EFIP) short-term course were conducted with 270 and 30 participants respectively. The Institute also made its contribution to the small-scale industry sector through Small Industry Management Program and Skill-cum-Technology Upgradation Programs with full financial support from the Small Industries Development Bank of India.

### **LAURELS AND DISTINCTIONS**

In their quest for excellence, teachers and students of IIT Kharagpur have been receiving awards and honours, laurels and distinctions. This year, too, faculty members have been honoured with prestigious awards, Chair Professorships and have been elected Fellows of the National Science Academy and Indian National Academy of Engineering.

The Department of Electronics & Electrical Communication Engineering has been awarded the prestigious TECHNOSHIELD award of Indian Semiconductor Association, Bangalore for their outstanding academic activities over the years in the areas of Microelectronics and VLSI.

Prof. Partha Pratim Chakrabarti of Computer Science & Engineering Department has been awarded the prestigious INAE Visvesvarya Chair Professorship. Dr. Suman Chakraborty of Mechanical Engineering Department has been awarded the National Science Academy Platinum Jubilee Young Scientist Award – 2007. Prof. Anil Kumar Gupta of Department of Geology & Geophysics and Prof. S. K. Som of Mechanical Engineering Department have been elected Fellows of National Academy of Sciences, India. Prof. Sankar Kumar Nath of Department of Geology & Geophysics has been elected Fellow of National Academy of Engineering. Prof. Pradip Kumar Ray of the Department of

Industrial Engineering & Management has been elected Fellow of the World Academy of Productivity Science. Prof. D. Sen of Department of Ocean Engineering & Naval Architecture has been elected Fellow of the Royal Institution of Naval Architects.

Prof. S. C. Kundu and Prof. A. K. Das of Department of Biotechnology have been selected as Fellows in West Bengal Academy of Science and Technology. The Biotech Research Society of India has awarded the Women Scientist Medal to Dr. Nirupama Mallick of Agricultural and Food Engineering Department. Dr. Madan Kukmar Jha of the same Department has received the Outstanding Book Award from the Indian Society of Agricultural Engineers. Prof. Tarasankar Pal of Department of Chemistry received the Chemical Research Society of India 2007 Medal. Prof. Debashis Roy has been awarded the bronze medal of the Chemical Research Society of India in recognition of his contribution to research in chemistry. Dr. Kumar Biradha of the same Department has been awarded the Scopus Young Scientist Award. Prof. Kanchan Chowdhury of Cryogenic Engineering Center has received the Endeavour India Executive Award from the Government of Australia. Dr. Chandan Chakraborty of Electrical Engineering Department has received the Institution of Electronics & Telecommunication Engineers-Bimal Bose Award. From the Department of Geology & Geophysics Prof. Anil Kumar Gupta was awarded the Dr. J. Coggin Brown Memorial (Gold) Medal for Geological Science, Prof. Sankar Kumar Nath received the D. N. Thakur Award from the Mining, Geological & Metallurgical Institute of India and Prof. Biswajit Mishra received the National Mineral Award. Dr. Chacko Jacob of Materials Science Centre has been awarded the Materials Research Society of India Medal. Prof. P. K. Mishra of Department of Mechanical Engineering received the Achievement Award from Production Engineering Division of Institution of Engineers. Dr. Suman Chakraborty of the same Department has been awarded the Anil Kumar Bose Memorial Award, 2007 of the Indian National Science Academy. Prof. Indranil Manna of the Department of Metallurgical and Materials Engineering Department has been nominated as Distinguished Materials Scientist by the Institutions of Engineers (India). Dr. Chandan Chakraborty of School of Medical Science & Technology received the Young Scientist Award from the Indian Science Congress Association. Prof. Samir Kumar Das of Department of Mining Engineering received the National Mining Award from the National Design and Research Forum.

Prof. Debabrata Das of Department of Biotechnology has been inducted into the Editorial Board of International Journal of Hydrogen Energy. Dr. Anjali Pal of Department of Civil Engineering has been selected in the Editorial Advisory Board for the journal Recent Patents on Nanotechnology. Prof. Subhasish Dey of the same Department has become Associate Editors of Journal of Hydro-Environment Research and International Journal of Sediment Research. Prof. Anupam Basu, Department of Computer Science and Engineering has been elected as Member, Technical Advisory Board, Microsoft Research, India and also a Member in the National Expert Committee, Rehabilitation Council of India. Prof. Partha Pratim Chakrabarti of the same Department has been elected as Member, Young Scientists and Project Excellence Awards Committee, Indian National Academy of Engineering. Prof. B. M. Mohan of Department of Electrical Engineering has been selected as an Associate Editor of journal of Automation And Control. Prof. Soumitro Banerjee of the same Department has been selected as the Associate Editor of the IEEE Transactions on Circuits and Systems. Prof. Mrityunjoy Chakraborty has joined the Editorial Board of the IEEE Transactions on Circuits and Systems and has also become a Guest Editor for the journal of Distributed Space Time Processing. Prof. D. Datta of the same Department is an Editor for the Journal of Optical Switching and Networking. Prof. S. Sahoo of the Department of Industrial Engineering and Management has been nominated as a Member of the Board of Governors of BIT, Sindri. Prof. Soumitra Paul of Department of Mechanical Engineering has joined the Editorial Board of journal of Abrasive Technology. Prof. Jayanta Bhattacharya of Department of Mining Engineering has been selected as a member of journal of Mineral Resource Engineering. Prof. C. K. Das of the Materials Science Centre has been selected as Members in the Editorial Boards of the Journal of Macro Molecular Research and the Journal of eXpress Polymer Letters, Germany. Prof. J. C. Misra of Centre for Theoretical Studies has been appointed as a member of the Board of Editors for the journal of Mechanics in Medicine and Biology.

Dr. Jagabandhu Panda, Research Scholar of the Department of Agricultural & Food Engineering received the Jawaharlal Nehru Award of ICAR for best Ph.D. thesis on natural resources

management. Sri Jayanta Das of the Department of Metallurgical & Materials Engineering received the Young Scientist Award, 2007 of the German Material Society.

## **ALUMNI AFFAIRS**

The alumni of the Institute have played a significant role in increasing the interaction of IIT Kharagpur in India and abroad. The alumni affairs website, with a link to the Institute website, facilitates alumni to communicate all over the globe. Once an alumnus registers online he or she is provided with a life long email address, which they can use, all their life. An extremely popular alumni newsletter "KGPian" is being published regularly every three months. An e-magazine called KGP Konnexion is also published which talks of recent development around campus. Technology Alumni Association Journal (TAAJ) is also published annually. The New Year brought together the alumni of the Institute in the Fourth Annual Alumni Meet 2006 held during 6-7th January 2006 where alumni from all over the world were invited. The Meet was organized for the graduates of 1957 and 1982. In the Alumni Meet, Prof. Asit Kumar Biswas, a 1961 graduate of Civil Engineering and the former President of the Third World Centre for Water Management, Mexico was conferred with the Distinguished Alumnus Award-2006. On the occasion he delivered a lecture on "Water Management"

In the Institute's efforts to strengthen the Global Alumni Network, the Alumni in India have formed the "IIT Kharagpur Alumni Foundation (India)" in May 2005. The foundation is in the process of integrating the activities of the various chapters of the Institute's alumni associations in the country. The foundation has been receiving generous support from the various chapters, individual alumni and friends.

Many of the Institute's illustrious alumni keep visiting us on a regular basis. During the past year a number of alumni visited the Institute. Prominent amongst them are Dr. Ruma Acharya Deysarkar, Dr. T. R. Seshadri, Mr. Peter Chan, Prof. Prithviraj Banerjee and Dr. Ramesh Sharma.

## **TRAINING AND PLACEMENT**

The Training and Placement Section of the Institute is actively interacting with different industries and organizations for arranging training and placement of the students. During 2006-2007, 147 companies and organizations visited the campus for taking placement interviews. In addition, 14 companies have either called the students for interviews at their premises or had telephone / video conference interviews. This year out of 1236 students who showed interests in availing the placement support, 1045 students have been successfully placed in different industries and organizations and the percentage of placement has been 84.47%. The current year's placement saw full-fledged participation of student in running the placement process. Harnessing student power has been very fruitful and students ensured that placement programs were run continuously as per schedule during the peak period of December 06 to February 07. 111 companies have offered summer training to the students and some of them provided financial assistance to the trainees. Students of the Institute also continue to visit countries outside India for their summer training.

## **STUDENTS' AFFAIRS**

Students' welfare is one of the Institute's major concerns. The Technology Students Gymkhana works towards the holistic personality development of the students by infusing in them a spirit of constructive cooperation, leadership qualities and organizational capabilities. Involving the students in a wide spectrum of sports and games as well as social, cultural and technological activities throughout the year is the major activity of the Gymkhana. This year the Gymkhana has setup a new modern gymnasium and billiards facility for the students.

The first year MCP students of the Department of Architecture & Regional Planning have won the General Championship Trophy in NOSPLAN (National Organization of Students of Planning) for the year 2006-2007.

Two students of the Department of Computer Science & Engineering won the First Prize for the best business proposal at the DST-Intel India Innovation Pioneers Challenge 2006-2007.

An IIT Kharagpur students' team won the Third Prize in the Challenger Round in the Rice University Business Plan Competition 2007, held at Rice University, USA.

In the 42<sup>nd</sup> Inter IIT Sports Meet, which was held during December 2006 at IIT Guwahati, IIT Kharagpur won gold medals in weight lifting, volleyball and hockey, silver medals in football and table tennis and bronze medals in athletics, basketball and badminton in men's section. In women's section, IIT Kharagpur won gold medal in table tennis and bronze medal in badminton.

Inter-Hall level competition constitutes the bulk of the Gymkhana activities. Inter Hall tournaments were organized last year in various sports events. Nehru Hall of Residence won the championship trophy in Inter-Hall athletics and the championship trophy for swimming. R.K. Hall of Residence won the championship trophy in water polo event. In social and cultural activities, Nehru Hall of Residence won the general championship trophy. Inter Hall Illumination and Rangoli competition was held on the festive occasion of Deepawali. R.P. Hall of Residence was adjudged first in Illumination competition and V.S. Hall of Residence was adjudged first in Rangoli competition.

This year fifteen students were awarded Institute Blue in sports and games; Order of Merit certificates were awarded to nine students for sports, social and cultural, and technology activities.

Spring Festival, the big bonanza of social and cultural activities in the campus was organized by the Gymkhana from 25<sup>th</sup> January to 28<sup>th</sup> January 2007. The IIT community and a number of contingents from several institutions of this region took part in the events held during the Spring Festival.

To keep IIT Kharagpur students in a leading role in the changing world scenario, the Techno-Management Festival – *Kshitij* was successfully organized from 1<sup>st</sup> February to 4<sup>th</sup> February 2007. The festival witnessed the presence of eminent personalities of global fame like Dr. Paul Crutzen, Nobel Laureate, Prof. Kasturi Rangan, Prof. Kevin Warwick and Wing Commander Rakesh Sharma, who delivered inspiring lectures on the occasion.

During the last academic session students registered with National Service Scheme (NSS) performed various social activities in and around the IIT campus including awareness generating campaigns on AIDS, literacy and against various social evils.

# **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 510. As per faculty : students ratio of 1 : 10, the faculty strength has to be increased to 660.

The Institute has 19 Departments, 6 Centres and 5 Schools. These are :

### **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 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.



## COURSES OFFERED BY DEPARTMENTS, CENTRES AND SCHOOLS

Faculty Strength – 488  
as on 30.06.2007

<b>Aerospace Engineering</b>	<b>13</b>
<p>B.Tech.(Hons.) in Aerospace Engineering                      M.Tech. in Aerospace Engineering                      M.Tech. Dual Degree 5 years in Aerospace Engineering                      Ph.D.</p>	
<b>Agricultural and Food Engineering</b>	<b>33</b>
<p>B.Tech.(Hons.) in Agricultural and Food Engineering                      M.Tech. in Agricultural Engineering with specialization in :</p> <ul style="list-style-type: none"> <li>i) Farm Machinery and Power</li> <li>ii) Soil &amp; Water Conservation Engineering</li> <li>iii) Agricultural Systems &amp; Management</li> <li>iv) Applied Botany</li> <li>v) Water Resources Development and Management</li> <li>vi) Aquacultural Engineering</li> <li>vii) Dairy &amp; Food Engineering</li> <li>viii) Post Harvest Engineering</li> </ul> <p>M.Tech. Dual Degree 5 years in Agricultural &amp; Food in any chosen specialisation                      Ph.D</p>	
<b>Architecture and Regional Planning</b>	<b>14</b>
<p>B.Arch. (Hons.) in Architecture                      Master of City Planning                      Ph.D.</p>	
<b>Biotechnology</b>	<b>10</b>
<p>B.Tech. in Biotechnology &amp; Biochemical Engineering                      M.Tech. in Biotechnology and Biochemical Engineering                      M.Tech. Dual Degree 5 years in Biotechnology &amp; Biochemical Engineering</p>	
<b>Chemical Engineering</b>	<b>21</b>
<p>B.Tech.(Hons.) in Chemical Engineering                      M.Tech. in Chemical Engineering                      M.Tech. Dual Degree 5 years in Chemical Engineering                      Ph.D.</p>	
<b>Chemistry</b>	<b>28</b>
<p>Integrated M.Sc. (5 yr.) in Industrial Chemistry                      M.Sc. (2 yr.) in Chemistry                      Ph.D.</p>	
<b>Civil Engineering</b>	<b>25</b>
<p>B.Tech.(Hons.) in Civil Engineering                      M.Tech. in Civil Engineering with specialization in:</p> <ul style="list-style-type: none"> <li>i) Structural Engineering</li> </ul>	

- 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 specialisation  
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 27**

- 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 specialisation  
Ph.D.

**Centre for Educational Technology 01**

- M.Tech in Media and Sound Engineering

**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.

<b>Humanities and Social Sciences</b>	<b>22</b>
Integrated M.Sc. (5 yr.) in Economics M.Tech. in Human Resources Development and Management Ph.D.	
<b>Industrial Engineering and Management</b>	<b>12</b>
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	
<b>Mathematics</b>	<b>26</b>
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.	
<b>Mechanical Engineering</b>	<b>40</b>
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 / Manufacturing Systems Engineering iii) Mechanical Engineering / Thermal, Energy & Environmental Engineering Ph. D.	
<b>Metallurgical &amp; Materials Engineering</b>	<b>20</b>
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.	
<b>Mining Engineering</b>	<b>12</b>
B.Tech.(Hons.) in Mining Engineering M.Tech. in Mining Engineering M.Tech. Dual Degree 5 years in i) Mining Engineering ii) Mining Engineering / Disaster Management in Mines Ph.D.	
<b>Ocean Engineering and Naval Architecture</b>	<b>11</b>
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.	
<b>Physics and Meteorology</b>	<b>27</b>
Integrated M.Sc. (5 yr.) in Physics M.Sc. (2 yr.) in Physics M.Tech. in Solid State Technology Ph.D.	
<b>Centre for Oceans, Rivers, Atmosphere and Land Sciences</b>	<b>04</b>
M.Tech in Earth System Science and Technology Ph.D	
<b>Cryogenic Engineering</b>	<b>10</b>
M.Tech. in Cryogenic Engineering Ph.D.	
<b>Materials Science</b>	<b>10</b>
M.Tech. in Materials Science and Engineering Ph.D.	
<b>Reliability Engineering Centre</b>	<b>04</b>
M.Tech in Reliability Engineering Ph.D	
<b>Rubber Technology</b>	<b>10</b>
M.Tech. in Rubber Technology Ph.D.	
<b>Rural Development</b>	<b>06</b>
Ph.D.	
<b>G. S. Sanyal School of Telecommunications</b>	<b>02</b>
Postgraduate Diploma in Telecommunications Networking Planning and Management	
<b>Rajiv Gandhi School of Intellectual Property Law</b>	<b>04</b>
LLB in Intellectual Property Law Postgraduate Diploma in Intellectual Property Law	
<b>School of Information Technology</b>	<b>06</b>
M.Tech. in Information Technology Postgraduate Diploma in Information Technology Ph.D	

**School of Medical Science & Technology** **09**

Master in Medical Science and Technology  
Ph.D

**Vinod Gupta School of Management** **10**

- i) Master of Business Administration
- ii) Postgraduate Diploma in Business Administration
- iii) Postgraduate Diploma in Management

## DEPARTMENT OF AEROSPACE ENGINEERING

**HEAD : Professor Prosun Kumar Datta**

### **FACULTY**

#### **Professor :**

Ghosh, A. K.	B.Tech., M.S., Ph.D. (IIT, Madras), Aerodynamics, Propulsion
Datta, P. K.	B.Tech. (Hons), M.S., Ph.D. (Georgia Tech., USA), Aerospace Structures
Bandyopadhyay, G.	B.Tech. (Hons), M.Tech., Ph.D. (IIT, Kharagpur), Aerodynamics
Singh, N.,	B.Tech. (Hons), M.Tech., Ph.D. (IIT, Kharagpur), Aerodynamics

#### **Associate Professor :**

Laha, M. K.	B.Tech. (Hons), M.Tech., Ph.D. (IIT, Kharagpur), Flight Mechanics
Rao, T. V.	B.E., M.E., Ph.D. (IISC, Bangalore), Propulsion, Combustion
Sinhamahapatra, K. P.	B.Tech. (Hons), Ph.D. (IIT, Kharagpur), Aerodynamics, Computational Fluid Dynamics
Maiti, Dipak Kumar	Ph.D. (IIT, Kharagpur), Aerospace Structures
Singh B. N.	B.E., M.Tech., Ph.D. (IIT Kanpur), Aerospace Structures, Composite Structures

#### **Assistant Professor :**

Ghosh, Anup	B.E., M.E., Ph.D. (IIT, Kharagpur), Aerospace Structures, Composite Structures
Pradhan, S. C.	B.Tech. (Hons), M.E., Ph.D. (IIT, Kanpur), Aerospace Structures
Sinha, M.	B.Tech. (Hons), M.Tech., Ph.D. (IIT, Kanpur), Flight Mechanics & Controls
Roy, Arnab	B.E., M.Tech., Ph.D. (IIT, Kharagpur), Aerodynamics

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

#### **Faculty Promotion :**

Prof. Navtej Singh	Professor
Dr. D. K. Maiti	Associate Professor
Dr. B. N. Singh	Associate Professor
Dr. T. V. Rao	Associate Professor

## RESEARCH AND DEVELOPMENT

### Brief descriptions of on-going activities :

#### i) Aerodynamics

1. Computational Aeroacoustics (CAA)
2. Aerodynamics of Thunderstorm Downburst
3. Analysis of High-Speed, High-Temperature Reactive Flows using LES
4. LES Simulation of High Speed Reacting Flow in Scramjet Combustor
5. Supersonic Flow over an Isotropic Compression Ramp
6. Supersonic Flow over a Cylinder with a Conical Nose
7. Unsteady Transonic and Supersonic Flows
8. Unstructured Grid Generation using Computational Geometric Technique
9. Development of Incompressible and Compressible Navier Stokes Solvers with suitable Turbulence Models
10. Flow-induced Vibration and Fluid-Structure Interaction
11. Numerical and Experimental Study of Flow over Building Structures

#### ii) Aerospace Structures

1. Vibration and Buckling Characteristics of Plates under biaxial loading
2. Composite & Smart Structures
3. Structural Dynamics & Aeroelasticity
4. Design & Development of MR-fluid damper
5. Development of experimental set-up for low velocity impact damage on laminated composite plates and shells
6. Static and Dynamic Analysis of Smart Damaged Composite
7. Hygrothermal Testing and Characterization of Composites
8. Analysis of Composite ISO-Grid Structures
9. Analysis of Multidirectional Smart Piezo-Fibre Reinforced Composite
10. Reliability Analysis of Composite Wing Subjected to Gust Loads
11. Nonlinear Analysis of Smart Composite Structure in Hygrothermal Environment
12. Analysis of Nanocomposites
13. Health monitoring of Composite Structure
14. Efficient Probabilistic Based Mathematical Modeling of Composite Structures with Shape Memory Alloys, Piezoelectric Materials and Magnetostrictive Materials; Development of Solution Methodology for such Complex Problems and its Experimental Verification
15. Least square finite element analysis of bonded joints
16. Analysis of FGM shells
17. Dynamic Instability behaviour of Aerospace Structures under Conservative and Non-Conservative Loadings

#### iii) Flight Mechanics and Controls

1. Developing UAV with reconfigurable control capability
2. Chandrayan mission work related to lunar topography and gravity modeling

#### iv) Aeromodelling

1. Development of Aeromodelling Laboratory
2. Development of Micro Air Vehicle

### Thrust Areas :

1. Wind Engineering and Industrial Aerodynamics

2. Aeroacoustics
3. Reactive flows
4. Supersonic Flows in Intakes
5. Supersonic Combustion
6. Hypersonic flows
7. Fluid-Structure Interaction
8. Subsonic and Supersonic Flow Visualization
9. Composite and smart Structures
10. Aeroelasticity
11. Damage Mechanics
12. Thermo Capillary Flows
13. Flight Dynamics and Intelligent Systems, System Identification
14. Micro Air Vehicle

**New Acquisitions :**

1. New equipments have been acquired to set up experimental facility for studying characteristics of Thunderstorm Downburst.
2. The following model aircrafts and items have been procured for the Aeromodelling Laboratory :
  - i) RAPTOR, 30 class RC Helicopter.  
Fuselage Length: 1150, Main Rotor Dia: 1245, Tail Rotor Dia: 260.
  - ii) Shuttle Plus, RC Helicopter.  
Fuselage Length: 1075, Main Rotor Dia: 1244, Tail Rotor Dia: 225.
  - iii) CESSNA, 4 Channel RC Airplane.  
Length: 750, Wing Span: 980.
  - iv) Santossa 1500, 2 Channel RC Glider (2Nos.).  
Length: 880, Wing Span: 1520.
  - v) Soaring Eagle, 3 Channel RC Glider (2Nos.).  
Length: 840, Wing Span: 1080.
  - vi) Real Flight G2, RC Model Flight Simulator.  
O.S. 46, petrol engine.
  - vii) Many other small equipments and tools for the laboratory.
3. Hilton Experimental Reaction Turbine: This reaction turbine is a radial inflow machine having the following experimental capabilities:
  - i) Visual demonstration of a small reaction turbine
  - ii) Torque speed / power speed curves from a no load speed exceeding 35000 rpm to stall for wide range of inlet pressures
  - iii) Evaluation of specific air consumption at a range of speeds and pressures
  - iv) Determination of isentropic efficiency and construction of retardation curve  
Make: P.A. Hilton Ltd., England
4. NI Compact DAQ Instrumentation Bundle with multiple channels capable of handling digital and analog inputs and outputs with a signal range of  $\pm 200$  mV to  $\pm 10$  V.  
Make: National Instruments, USA.
5. NI LabVIEW software (Departmental Licence). Make: National Instruments, USA.
6. DSA 3217 Scanivalve Pressure Scanner (16 port, 1psi differential pressure). Make: Scanivalve Corp., USA.
7. Laminar Flow Table for potential flow visualisation using a combination of sources and sinks. Make: Armfield Inc., UK.
8. Vishay Signal Conditioner, USA: Includes a power input module which gives the bridge excitation, 2 channels for analog input and 3 ½ digit peak read indicator
9. Keithley Digital Micrometer: For accurate measurement of very low analog signals coming from pressure transducers
10. Vibration Shake Table:  
Details of the Item  
A complete shake Table of 3000 Kgf force capacity with the following features is procured by the department of Aerospace Engineering under FIST (DST) sponsored



project. Features: (1) High Performance desktop analysis/control peripherals with COUGAR Control System, (2) CATS Random, Sine & Classical Shock Controller Software, (3) One electrodynamic shaker of 3000 Kgf capacity, (4) Mechanical arrangements & moving plates, (5) Payload : 100 Kg, (6) Frequency range 5-2000 Hz, (7) Three Linear axes, (8) Table Size 1m x 1m, (9) 12.048 g under 100 Kg payload and (10) Peak-peak displacement - 51mm. The instrument is installed and commissioned by the company (Spectral Dynamics Solutions, USA & AIMIL, Kolkata) very recently.

11. Upgradation of INSTRON 1342:  
EXTEND Digital Control Upgrade and Interface Electronics for Instron 1340 and 8030 Servo Hydraulic machines. Suitable for actuator in platen machines only. Provides control of hydraulic power unit in single frame/single power supply installations. FastTrack Console Software For Use With FastTrack 8800 And 8500PLUS(v37) Controllers.
12. Shock Accelerometer and power supply

## ON-GOING RESEARCH PROJECTS

### Sponsored Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Research activities in computational fluid dynamics	HyPerComp, Inc., USA	USD 20000.00
2.	Development of a three-dimensional unsteady implicit hypersonic viscous turbulent flow solver on an unstructured grid	DRDL	9.2 Lakhs
3.	Axisymmetric and Non-Axisymmetric, Subsonic and Supersonic Jet Aerodynamics-Aeroacoustics using the Three-Dimensional Navier-Stokes/Euler Coupled Simulation	AR&DB	3.44 Lakhs
4.	Three-dimensional unstructured grid generation for viscous flow computation about complex configurations using computational geometric technique	DRDL	9.8 Lakhs
5.	Setting Up of AR&DB's Associate Centre of CFD at IIT Kharagpur	AR&DB	23.2 Lakhs
6.	Analysis of High Temperature Hypersonic Flows Using Real Gas Flux Splitting Algorithm Considering Equilibrium and Non-equilibrium Air Chemistry	AR&DB	3.46 Lakhs
7.	LES Simulation of Reactive Flow	DRDL	9.975 Lakhs
8.	Hazard Analysis of Liq. Propellant	ITR Chandipur	4.5 Lakhs
9.	A Study of Wind Movement during Downburst in a Thunderstorm	DST	19.62 Lakhs
10.	Centre of Excellence for Composite Structures Technology Phase II	AR&DB, New Delhi	75.90 Lakhs
11.	Aeroelastic Tailoring of a Composite Lifting Surface Using Smart Structures Concept	IIT KGP	3.0 Lakhs
12.	Design and Development of MR-Fluid Based Damper for Aircraft Applications	ADA, Bangalore	17.25 Lakhs

13.	Aeroelastic Analysis of a Lifting Surface Employing Active Fiber Composite Under Hygro-Thermal Environment	AR&DB, New Delhi	8.96 Lakhs
14.	FIST Program, Department of Aerospace Engineering	DST, New Delhi	105.0 Lakhs
15.	Non-linear vibration study of smart laminated composite plates with uncertain system properties in random hygrothermal environments	AR&DB	5.94 Lakhs
16.	Dynamic Characteristics of thermally post-buckled composite panels embedded with SMA Fibers	DRDO	7.70 Lakhs
17.	Finite element analysis of the FGM cone nozzle	IIT KGP	2.10 Lakhs
18.	Least square finite element analysis of adhesively bonded joint	AR&DB	4.45 Lakhs
19.	Dynamic Instability Behaviour of Aerospace Structures under Follower Loading	AR&DB	6.5 Lakhs
20.	Studies on Initiation and Propagation of Damage in Smart Composite Plates and Shells	IIT KGP	2.80 Lakhs
21.	Composite Application Laboratory	DST, New Delhi	346.20 Lakhs
22.	Lunar Topography and Gravity Modeling	ISRO	1.0 Lakh
23.	Reconfigurable Flight Control Design	DRDO	9.89 Lakhs
24.	Intelligent Hybrid Flight Control Design	AR&DB	6.01 Lakhs
25.	Intelligent Flight Control System	IIT KGP	3.00 Lakhs
26.	Experimental and Numerical Investigation of Flow Past Two-Dimensional Arbitrary Body Geometries at Subsonic and Supersonic Speeds	IIT KGP	3.00 Lakhs

#### Consultancy Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Question Paper settings and evaluation for Indian Airlines	Indian Airlines, Hyderabad	1.87 Lakhs

#### VISITS ABROAD BY FACULTY MEMBER

1.	Prof. P. K. Datta	Key Note Talk and Paper presentation at 49 <sup>th</sup> Structures Conference of JSME/JSAAS at Fukishama, Japan (June 26-29, 2007)
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#### INVITED LECTURES BY FACULTY MEMBERS

1.	Prof. P. K. Datta	Tension Buckling in Aerospace Structures, at Dept. of Mechanical & Systems Engg. at Ryukoku University, Japan on 26 June 2007
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2. Dr. K. P. Sinhamahapatra Aeroacoustic Computations for supersonic jets, DRDL Hyderabad
3. Dr. K. P. Sinhamahapatra Unstructured grid generation for complex configurations using computational geometric techniques, DRDL Hyderabad
4. Dr. K. P. Sinhamahapatra Simulation of high-speed, high-temperature reactive flows, Science College, Calcutta University
5. Dr. B. N. Singh The Stochastic FEM at MNNIT, Allahabad, UP, India, February 3, 2007

#### **THESES : DOCTORAL AND MS**

#	Name of Scholar	Title of Thesis
1.	S. N. Patel	Dynamic Stability of Laminated Composite Stiffened Shell Panels with Cutouts subjected to Non-Uniform In-Plane Harmonic Edge Loading
2.	C. K. Kundu	Nonlinear Finite Element Analysis of Laminated Composite and Smart Shells
3.	Achchhe Lal	Some studies on stochastic response of laminated plates composite resting on elastic foundation with uncertain system parameters

#### **LAURELS & DISTINCTIONS**

1. Dr. K. P. Sinhamahapatra Fellowship of Institution of Engineers

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

1. AICTE sponsored QIP Short Term Course entitled "Advanced Structural Analysis" October 9-13, 2006
2. Academic Programme on Aircraft Engineering, Avionics and Manufacturing Technology for HAL Design Trainees, (44 Nos.) July 19 – November 11, 2006
3. Academic Programme on Aircraft Engineering, Avionics and Manufacturing Technology for HAL Design Trainees, (46 Nos.) January 02 – April 30, 2007

## 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, Watershed Management
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
Raghuwanshi, 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, Snehasish	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, Sustainable Life-style, Stress Management
Raheman, Hifjur	Ph.D. (AIT, Bangkok), Farm Machinery & Power
Thomas, E V	Ph.D. (IIT Kharagpur), Farm Machinery & Power

**Assistant Professor :**

Chatterjee, Chandranath	Ph.D. (IIT Kharagpur), Soil and Water Conservation Engineering
Das, Madhusweta	Ph.D. (Jadavpur University), Food Technology & Biochemical Engineering
Guha, Proshanta	Ph.D. (IIT Kharagpur), Agronomy
Mukherjee, Chanchal Kumar	MS. (New Jersey), Naval Architecture & Ocean Engineering
Shrivastava, Shanker Lal	Ph.D. (IIT Kharagpur), Post Harvest Engineeringg / Dairy & Food Engineering
Srinivasa Rao, Pavuluri	Ph.D. (IIT Kharagpur), Post Harvest Engineering, Aquacultural Engineering
Srivastav, Prem Prakash	Ph.D. (IIT Kharagpur), Food Technology
Swain, Dillip Kumar	Ph.D. (IIT Kharagpur), Agronomy

**Sr. Lecturer :**

Moullick, Sanjib	Ph.D. (IIT Kharagpur), Aquacultural Engineering
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**Emeritus Professor :**

Chattopadhyay, P. K.	Ph.D. (IIT Kharagpur), Agricultural and Food Engineering
Bal, Satish	Ph.D. (IIT Kharagpur), Post Harvest Technology, Rice Milling
Prasad, Suresh	Ph.D. (IIT Kharagpur), Food Process Engineering, Post Harvest Engineering
Das, H.	MS (Umass Amherst, USA), Food and Dairy Engineering

**Senior Scientific Officer :**

Singh, Manindra Nath	Ph.D. (BHU), Entomology, Grain Storage, Plant Protection
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**Senior Research Officer :**

Yadav, Radhey Shyam	Ph.D. (IIT Kharagpur), Farm Machinery & Power
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**Scientific Officer :**

Kar, Nandita	D.Phil. (Allahabad Univ), Post Harvest Chemistry & Processing
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## **FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION**

### **Faculty Appointment :**

Dr. Madhusweta Das	Assistant Professor
Dr. Proshanta Guha	Assistant Professor
Dr. Prem Prakash Srivastav	Assistant Professor
Dr. Shanker Lal Shrivastava	Assistant Professor
Dr. Dilip Swain	Assistant Professor
Dr. Sanjib Moulick	Lecturer

### **Faculty Appointed as Emeritus Professor :**

Prof. P. K. Chattopadhyay	Emeritus Professor
Prof. Satish Bal	Emeritus Professor
Prof. Suresh Prasad	Emeritus Professor
Prof. H. Das	Emeritus Professor

### **Faculty Promotion :**

Prof. Tridib Kumar Goswami	Professor
Dr. Bhabani Shankar Das	Associate Professor
Dr. Adinpunya Mitra	Associate Professor

### **Faculty Retirement :**

Prof. Satish Bal	Professor
Prof. Suresh Prasad	Professor
Prof. Hrishikesh Das	Professor

## **RESEARCH AND DEVELOPMENT**

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

1. Application of GIS in both command area and watershed management
2. Application of neural network in hydrology
3. Ballast management of agricultural tractors
4. Biosynthesis of hydroxybenzoates in plants and in vitro cultures
5. Bio-fuels from tree-based oils
6. Design and development of continually variable transmission for tractors
7. Design, development and field evaluation of a small power tractor
8. Design and development of slip meter for two-wheel drive tractors
9. Design and development of automatic depth control system for tractors
10. Design and development of ergo NVH\_ag 1.0 software
11. Design and development of noise and vibration reducing device for hand tractor
12. Design and development of noise and vibration reducing device for vertical conveyer reaper

13. Design of a centrifugal press for semi-continuous production of paneer
14. Development of aseptic packaging system for milk
15. Development of environment-friendly aquaculture
16. Development of food products
17. Development of machineries and process technology for cereals & pulses based snacks,
18. Development of rice transplanter
19. Development of a continuous chhana making device
20. Development of jacketted scraped surface vessel for kneading, heating and concentration of high viscosity liquids and pastes
21. Development of sandesh portioning and shaping device
22. Development of endless chain pressure dryer for orthodox tea
23. Development of Cashew nut sheller and Cashew peeler
24. Development of combined tillage implements for high hp tractors
25. Extraction of essential oil
26. Flow and solute transport in sub-surface environment
27. Food Packaging
28. Hydrological modelling of small watersheds
29. Integration of surface irrigation and two-dimension infiltration model
30. Machinery systems and ergonomics
31. Microbial degradation of plant phenolics for value-added products
32. Micropropagation system for *Aloe vera*
33. Microwave assisted drying of high moisture food
34. Nutrient management
35. Polyhydroxyalkanoates from Cyanobacteria
36. Predicting traction performance using artificial neural network
37. Process technology for dehydration of mushrooms
38. Production and processing of tea
39. Production of tannase under solid state fermentation
40. Process technology for dahi powder and dahi powder based energy drink mix
41. Process technology for antioxidant rich RTE health food
42. Process technology for manufacture of RTE health food (herbal kurkure)
43. Rainwater harvesting and groundwater recharge
44. Software development for machinery management
45. Thermal analysis of food materials
46. Traction potential of bias-ply tyres used in agricultural tractors
47. Water quality and watershed management

**Thrust Areas :**

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

**New Acquisitions :**

1. High Performance Liquid Chromatograph
2. Capillary Electrophoresis
3. Elisa Reader
4. PCR System
5. Protein Purification System
6. Rotaphore
7. Micro Kjeldahl Nitrogen Analyzer

## ON-GOING RESEARCH PROJECTS

### Sponsored Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	AICRP on PFTC and R & D of Farm Implement & Machinery	ICAR, New Delhi	95.91 Lakhs
2.	AICRP on Post Harvest Technology	ICAR, New Delhi	60.00 Lakhs
3.	Application of Image Processing Technology for Quality Assessment of Food Material	Ministry of Food Processing Industries, New Delhi	39.50 Lakhs
4.	Biosoftening of stem	ITC	37.00 Lakhs
5.	Biosynthesis of polyhydroxyalkanoates from cyanobacteria: a low cost cultivation and production technology using wastewater	DBT	21.95 Lakhs
6.	Characterization of a novel phenylpropanoid enzyme of sinapic acid catabolism in <i>Paecilomyces variotii</i>	International Foundation for Science, Sweden	4.50 Lakhs
7.	Cyanobacterial metal binding, detoxification and metal removal from aquatic ecosystems	Ministry of Environment & Forests	7.65 Lakhs
8.	Development and test of a socio-technical model for assessing occupational risk of injuries and illnesses to mine workers	CSIR, New Delhi	7.64 Lakhs
9.	Development modifications of spindle drives	Pradhan, Deoghar, Jharkhand	2.00 Lakhs
10.	Development of combined tillage implement for improving performance of tractor-implement combination	CSIR	9.82 Lakhs
11.	Development of equipment for continuous production of chhana and sandesh	National Dairy Development Board, Anand	19.40 Lakhs
12.	Development of natural fibre-reinforced starch based eco-friendly films for packaging food and making shopping bags	IIT Kharagpur	2.10 Lakhs
13.	Development of nursery and management of seedlings of selected medicinal and aromatic plants for Purulia district	National Medicinal Plant Board	7.00 Lakhs
14.	Development of pottery industry with special reference to disposable cups	Hérons Bonsai Ltd., UK	1.60 Lakhs
15.	Development of process technology for in vitro enzymatic detoxification of food infected with aflatoxin B1 using horse radish peroxidase enzyme	Department of Science & Technology, New Delhi	5.26 Lakhs
16.	Development of process technology for manufacture of cereal-fruit based extruded snack foods	IIT Kharagpur	3.00 Lakhs



17.	Development of process technology for production of ready-to-eat health foods/snacks and energy drinks	Ministry of Food Processing Industries, Govt. of India	29.00 Lakhs
18.	Development of prototype for semi-continuous production of paneer	National Dairy Development Board, Anand	5.25 Lakhs
19.	Development of ready to eat snacks from low value under utilized marine fishes	IIT Kharagpur	2.40 Lakhs
20.	Development of technology for enzymatic treatment of rice	Indian Council of Agricultural Research	18.00 Lakhs
21.	Discovering novel metabolic route(s) to phenolic-fragrance formation in <i>Hemidesmus indicus</i> roots	DBT	13.40 Lakhs
22.	DST-FIST Project for Strengthening Teaching and Research in WRDM	DST	78.00 Lakhs
23.	Effect of drag reducing polymers (DRP) in particle size distribution of sprinkler irrigation system and long term effect of DRP in soil and crop growth	ICAR, New Delhi	16.70 Lakhs
24.	Ergonomics and safety in agriculture	ICAR, New Delhi	194.10 Lakhs
25.	Evaluation of competitive diffusive mass transfer and degradation kinetics of lignin, humic substances and xenobiotic compounds in agroresidues	MHRD	10.00 Lakhs
26.	Experimental agro-meteorological advisory service unit	DST, New Delhi	5.00 Lakhs
27.	Flood hazard mapping and flood risk zoning for a river reach	IIT Kharagpur	3.00 Lakhs
28.	Frontline demonstration of agricultural machinery	ICAR, New Delhi	12.00 Lakhs
29.	Geo-spatial resources management with computer simulation of flood inundation for Mayurakshi and Ajoy river basins using RS and GIS	DST, New Delhi	13.77 Lakhs
30.	Hydrological water balance modeling of rainfed watershed for improved water management	NATP, ICAR New Delhi	36.00 Lakhs
31.	Identification, quantification and control of non point source pollution of water resource in Agril. Lands	Ministry of Water Resources, Govt. of India	57.80 Lakhs
32.	Impact of climate change on rice yield of West Bengal: A field experiment and simulation study	IIT Kharagpur	1.00 Lakhs
33.	Low-cost production of [P(3HB-co-3HV)] co-polymer from cyanobacteria and exploring its biomedical applications	CSIR, New Delhi	11.50 Lakhs

34.	Mechanised food engineering	IIT Kharagpur	5.00 Lakhs
35.	Metabolite profiling of phenolics from developing mesocarp of tender coconut for probing hydroxybenzoate biosynthesis	CSIR	9.00 Lakhs
36.	Microbial degradation of plant phenolics for high-value flavours	AICTE Career Award	10.50 Lakhs
37.	Microwave assisted hot air and vacuum drying of fruits and spices	Ministry of Food Processing Industries, Govt. of India, New Delhi	29.00 Lakhs
38.	Mission project on Technology travels to villages - sub project: Integrated Rural Food Processing & Training Centre	IIT Kharagpur	86.00 Lakhs
39.	Modeling flow and sediment transport phenomena for improved furrow irrigation management	Volkswagen Foundation, Germany	35.00 Lakhs
40.	Modernization and removal of obsolescence from Dairy and Food Engineering Laboratory	Ministry of Human Resources Development	12.00 Lakhs
41.	Novel approaches to understanding cell wall phenolics for improving raw materials quality in food plants	DST	20.05 Lakhs
42.	Precision Farming Development Centre	Min. of Agriculture, Govt. of India	150.00 Lakhs
43.	Processing and value addition to basmati rice	L.T. Overseas Limited	1.00 Lakhs
44.	Processing of Kinnow, apple, pomegranate juice	ICAR, New Delhi	19.68 Lakhs
45.	Production and performance evaluation of biodiesel from tree based oils (with high free fatty acids) and their mixtures	Ministry of Petroleum & Natural Gas, Govt. of India	11.62 Lakhs
46.	Production of fruit and vegetable juice powders using vacuum puff drying technique	Indian Council Agricultural Research, New Delhi	16.83 Lakhs
47.	Productivity management in rice production activities- a data envelopment analysis	ICAR	13.64 Lakhs
48.	Purification and characterization of glycosidic conjugates from <i>Bryophyllum pinnatum</i> for their anti diabetic, antioxidant and anti-tyrosinase activity	CSIR	11.52 Lakhs
49.	Rapid control atmosphere storage of fruits	Ministry of Food Processing Industries	48.00 Lakhs
50.	Reduction of vibration & noise in self-propelled reaper & power-tiller	ICAR, New Delhi	13.80 Lakhs
51.	Root exudates and phosphorus nutrition of crops and phosphorus uptake by arbuscular mycorrhizae: mechanisms and modeling	ICAR, Govt. of India	7.50 Lakhs

52.	RUD projects	IPPI, New Delhi	3.50 Lakhs
53.	Screening of <i>Aloe vera</i> L. germplasms for cosmetic gel and micropropagation of elite clones	Department of Science & Technology	15.00 Lakhs
54.	Simulation/Optimization modelling for integrated land and water resources management in the canal commands of the Hirakud Irrigation Project, Orissa,	DST-DAAD	2.30 Lakhs
55.	Study of boundary layer characteristics during occurrence of severe thunderstorm	Department of Science and Technology	46.00 Lakhs
56.	Tagatose: a low calorie sweetener	Ministry of Food Processing Industry	69.50 Lakhs
57.	Techno-economic feasibility of integrated aquaculture options within irrigation systems	Indian Council of Agricultural Research	31.03 Lakhs

**Consultancy Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	A small system for enhancing shelf life of fresh betel leaf	Private Party, Kaktia Bazar, Tamluk, E. Midnapore	0.04 Lakhs
2.	Aquatic survey of noamundi iron mine	The Tata Iron and Steel Company Limited	3.00 Lakhs
3.	Construction of periphery road in the Bharatiya Reserve Bank Note Mudran Pvt. Limited, Salboni	Bharatiya Reserve Bank Note Mudran Pvt. Limited, Salboni	10.00 Lakhs
4.	Demonstration of technology for enhancing shelf life, scientific storage and packing for transportation of fresh betel leaf	Haldia Logistics Pvt. Ltd., Kolkata	0.20 Lakhs
5.	Determination of out-turn ratio of common varieties of paddy grown in WB, Bihar and Assam	Food Corporation of India	7.20 Lakhs
6.	Educational and design software	State and Central Govt. Agencies	4.00 Lakhs
7.	Evaluation of central sector schemes on oilseeds, pulses, oil palm and maize	Agricultural Finance Corporation, New Delhi	0.50 Lakhs
8.	Extraction of essential oil from betel leaf	Chak-Kumar Milan Sangha, Debra, W. Midnapore	0.01 Lakhs
9.	Feasibility study and design of a radial collector well system for South Eastern Railway Kharagpur	S.E. Railway, Kharagpur	2.00 Lakhs
10.	Feasibility study report preparation of tea processing industry	Tea Board, Kolkata	8.26 Lakhs

11.	Long distance marketing of preserved Betel Leaf	Kaktia Bazar, Tamluk, E. Midnapore	0.10 Lakhs
12.	Out turn ratio of paddy milling	FCI	4.00 Lakhs
13.	Performance evaluation of tractor radial tyres	Apollo Tyres Ltd Vadodara	5.51 Lakhs
14.	Performance of bias and radial ply tyres	Apollo Tyres Ltd, Vadodara	6.06 Lakhs
15.	Perspective plan for development of Pashimanchal Unnayan Parishad	Government of West Bengal	11.50 Lakhs
16.	Rain water harvesting at Bharatiya Reserve Bank Note Mudran Pvt. Limited, Salboni campus, Salboni	Bharatiya Reserve Bank Note Mudran Pvt. Limited, Salboni	5.60 Lakhs
17.	Rain water harvesting at Tata Metaliks campus, Kharagpur	Tata Metaliks, Kharagpur	3.40 Lakhs
18.	Rain water harvesting at aluminium refinery, NALCO, Damanjodi	National Aluminium Company, Damanjodi	4.15 Lakhs
19.	Rain water harvesting at NALCO, Damunjodi, Orissa	NALCO, Orissa	4.30 Lakhs
20.	Rain water harvesting at UAL Bengal Campus	UAL, Bengal	1.12 Lakhs
21.	Rain water harvesting in some mines of UCIL	Uranium Corporation of India, Ltd., Jaduguda, Jharkhand	1.20 Lakhs
22.	Rice mill testing	Midnapore Rice Mill Owners' Association	1.08 Lakhs
23.	Soil and water quality management of Tata Steel	Tata Iron and Steel Company Limited, Jamshedpur	5.29 Lakhs
24.	Study of effect of mining activities on surrounding water quality	Tata Steel, Noamundi	7.70 Lakhs
25.	Testing of Angad Tractor of low horse power range	M/s SAS Motors, New Delhi	3.00 Lakhs
26.	Testing of rice mills in Midnapore District	Midnapore Rice Miller's Association, Midnapore	0.50 Lakhs
27.	Testing the efficacy of controlled-release fertilizer multigro for different crops	Haifa Chemicals Limited	14.50 Lakhs
28.	Trial milling of paddy	Food Corporation of India	7.00 Lakhs
29.	Trial milling of paddy in the states of Bengal, Bihar & Assam	Food Corporation of India	7.20 Lakhs

#### **VISITS ABROAD BY FACULTY MEMBER**

1. Prof. Rintu Banerjee International Conference on biofuel (London) April 22-27, 2007

2. Prof. P. B. S. Bhadoria Teaching (AIT Bangkok) Jan - April, 2007
3. Prof. P. B. S. Bhadoria Presentation of Research paper (Univ. of Hoheneim, Stuttgart, Germany) Sept. 26-28, 2006
4. Prof. P. B. S. Bhadoria Research work (A v H Fellowship, Goettingen University, June – July, 2007)
5. Prof. Susanta Kumar Das Presenting Paper in a International Meet of the ASABE (Portland, Oregon, USA) July 7-13
6. Dr. Snehasish Dutta Gupta JSPS Invited Fellow (Yamaguchi University, Japan) May 14 - July 12, 2007
7. Prof. Tridib Kumar Goswami Presenting paper at ASABE Annual Meet (Portland, Oregon, USA) July 7-13, 2006
8. Prof. Bimal Chandra Mal International Conference, Academic Interaction (Portland, Ohio State University, Columbus) One month
9. Dr. Adinpunya Mitra Sabbatical Leave (TU-Braunschweig, Germany) 15<sup>th</sup> August 2006 to 26<sup>th</sup> July 2007
10. Prof. Rabindra Kumar Panda To participate in a Conference (Beijing, China) 7 days
11. Prof. Sudhindra Nath Panda To deliver an invited talk on Rainwater Harvesting Research at IIT, Kharagpur (University of Adelaide, Australia) February 7 – 18, 2007
12. Prof. Sudhindra Nath Panda Preparation of final project report for DST-DAAD project (University of Hannover, Germany) 28 April – 20 May, 2007
13. Prof. Suresh Prasad Academic interaction and Research and Development Collaboration (Bioresource Engineering Department, McGill University, Macdonald Campus, Montreal, Canada) June 24 – July 23, 2007
14. Prof. Suresh Prasad Academic Interaction and Discussion on Research and Development Activities (Washington State University, Pullman) July 13-18, 2007
15. Prof. Suresh Prasad Academic Research and Development Interaction (USDA Western Regional Research Center, Albany, California, USA) July 21-22, 2007
16. Prof. Narendra Singh Raghuwanshi To attend World Water Week (Stockholm) August 20-26, 2006
17. Prof. Rajendra Singh To attend Water Week (Stockholm, Sweden) August 18-27, 2006
18. Prof. Rajendra Singh To teach a summer course under DAAD Visiting Professorship Program (Potsdam, Germany) 2 May – 29 July, 2007

### LECTURE BY VISITING EXPERT

1. Prof. G. Venkatrathnam, IIT Madras Low temperature mixed refrigerant cascade refrigerator for cooling of electronics, nitrogen liquifaction and food preservation
2. Mr. N. K. Mandal, Divisional Forest Officer Employment status in Forestry in India and West Bengal in particular
3. Mr. N. K. Mandal, Divisional Forest Officer Forest Organization and Functions in West Bengal

### INVITED LECTURES BY FACULTY MEMBERS

1. Prof. Ashis Kumar Datta Food Processing Industry: Status and Perspective (Haldia Institute of Technology, Haldia, East Medinipur, West Bengal)
2. Prof. Bimal Chandra Mal Successful Micro-Enterprises (National Seminar on Women and Food Technology, IIT Delhi)
3. Prof. Bimal Chandra Mal Technological Options for Aquaculture in Canal Command (JNKVV, Jabalpur)
4. Prof. Narendra Singh Raghuwanshi Soil Conservation Structures Design (DVC, Ranchi)
5. Prof. Narendra Singh Raghuwanshi Soil Conservation Measures (Siliguri)
6. Prof. Hrishikes Das Vacuum Drying of Food (National Dairy Research Institute, Karnal)
7. Prof. Kamlesh Narayan Tiwari Pressurized Irrigation (Seminar on "Protected Cultivation & Pressurized irrigation System", Sinclairs Hotel, Siliguri, West Bengal)
8. Prof. Snehasish Dutta Gupta Artificial neural network in plant tissue culture: Applications and potentials (Haldia Institute of Technology, West Bengal)
9. Prof. Snehasish Dutta Gupta Advances in micropropagation of gladiolus (Yamaguchi University, Japan)
10. Prof. Snehasish Dutta Gupta Micropropagation of gladiolus in liquid culture with support systems and evaluation of hyperhydricity by Dutta Gupta, Snehasish (Tokai University, Japan)
11. Dr. Adinpunya Mitra Phenylpropanoid metabolism in plants and microbes (Institute of Pharmaceutical Biology, Braunschweig, Germany)
12. Prof. Suresh Suresh Challenges in Food Processing Research in Next Decade (United States Department of Agriculture, Western Regional research Center, Albany, San Francisco, California, USA)
13. Prof. Hari Niwas Mishra Innovative Food Processing Technologies (Jamshedpur)
14. Prof. Hari Niwas Mishra Food Processing in India - Opportunities and Challenges (Allahabad)

15.	Prof. Hari Niwas Mishra	Emerging Food Processing Technologies (Varanasi)
16.	Prof. Hari Niwas Mishra	Processing of Tea, Coffee and Cocoa Products (Kanpur)
17.	Prof. Hari Niwas Mishra	Chemical Changes during Food Processing - Effect on quality & Safety (Kolkata)
18.	Prof. Kamlesh Tiwari	Sedimentation of Reservoir and Control (DVC Hazaribag, Jharkhand)
19.	Prof. Sudhindra Nath Panda	Command area development programme with special emphasis on biodiversity (Water Technology Centre for Eastern Region (ICAR), Bhubaneswar)
20.	Prof. Sudhindra Nath Panda	Simulation / Optimization Modelling for Integrated Land and Water Resources Management (University of Hannover)
21.	Dr. Madan Kumar Jha	Application of GIS in Groundwater Modeling: Opportunities and Challenges (Geological Survey of India Training Institute (GSITI), Hyderabad)
22.	Dr. Madan Kumar Jha	Application of GIS in Groundwater Modeling: Salient Case Studies (Geological Survey of India Training Institute (GSITI), Hyderabad)
23.	Prof. Rajendra Singh	Risk and uncertainty analysis in water allocation and agricultural water management (Stockholm, Sweden)
24.	Dr. H. Raheman	Bioelectricity generation from biofuels - A perspective for rural electrification (India-Canada Biofuels Workshop)

#### THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	R. Rajani	Simulation-optimization modelling for efficient management of a coastal groundwater basin
2.	V. K. Tiwari	Traction potential of bias-ply tyres used in agricultural tractors
3.	Divyendu Kamilya	Immune effector activities of mushroom glucan and bovine lactoferrin on Indian major carp Catla, <i>Catla catla</i> (Hamilton)
4.	Anannya Banga	Transgenic insect resistant rice lines expressing a novel cry1Ab type toxin gene of <i>Bacillus thuringiensis</i>
5.	Sujata Jena	Technology development for production of vacuum dried coconut milk powder
6.	Damodhara Rao M	Development and Testing of a Physically Based Model (ZIGASED) for Simulating Flow and Sediment Transport in Furrow Irrigation
7.	Sushmita Patnaik	Studies on the pollution caused by brackish water shrimp farms and improvement of farm effluent quality
8.	S. V. Ghadge	Production and performance of mahua ( <i>Madhuca indica</i> ) biodiesel in a compression ignition engine
9.	Saroj Kumar Giri	Microwave-vacuum drying of button mushroom ( <i>Agaricus bisporus</i> )

10. Saswati Ghosh      Microbial transformation of ferulic acid to vanillin and vanillic acid
11. Ms. Mithu Das      Enzymatic polishing of germinated brown rice
12. M. K. Chourasia      CFD modeling for heat and mass transfer on potato in cold store
13. Pramod Rai      Clarification of mousambi (*Citrus sinensis* (L.) Obsbeck) juice using membrane technology
14. Devesh Pandey      Simulation and optimization modeling for irrigated crop planning
15. Asif Umer Pagarkar      Development of extruded fish soya product from low cost fish (Croaker: *Otolithus sp.*) as a fish meat analogue and utilization of its by-product in prawn, *Macrobrachium rogenbergii*, feed
16. Amit Nath      study on process technology for production of potato based ready-to-eat snacks
17. Sangeeta Negi      Production of multi enzymes amylase and protease from *Aspergillus awamori nakazawa* and studies on their physio-chemical properties
18. Alivia Chowdhury      Evaluation of ground water potential in West Medinipur district using remote sensing and GIS
19. V. S. S. Prasad      Development of liquid culture and machine vision systems for efficient Micropropagation of *Gladiolus hybridus Hort*

#### BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	R. S. Govindaraju and Dr. B. S. Das	Moment analysis for subsurface hydrologic applications	Springer, The Netherlands	2007
2.	B. C. Bhattacharyya and Prof. Rintu Banerjee	Environmental Biotechnology	Oxford University Press	2007

#### PATENTS GRANTED

1. Prof. P. K. Chattopadhyay      A process for the preparation of dehydrated puffed potato cubes; Patent No. 205 521, Date of Grant: 05/04/2007
2. Prof. P. B. S. Bhadoria      Soil liming software, Economic analysis software, Nutrient management software, Intercropping software (Copy Right No. : SW-3589-92, 2007)

#### LAURELS & DISTINCTIONS

1. Prof. P. B. S. Bhadoria      Humboldt Fellowship (2007)
2. Prof. P. B. S. Bhadoria      Visiting Professor, AIT, Bangkok (2007)
3. Dr. P. K. Sahoo, Ex-Research Scholar      APV Seligman Food Engineering Fellow (2006)
4. Dr. P. K. Nema, Ex-Research Scholar      APV Seligman Food Engineering Fellow (2007)
5. Prof. Ashis Kumar Datta      Best Poster Paper - Second Prize, XXXV Dairy Industry Conference, Kolkata (2006)
6. Dr. Snehasish Dutta Gupta      JSPS Invitation Fellowship (2007)



- |     |                             |   |
|-----|-----------------------------|---|
| 7.  | Dr. Madan Kumar Jha         | 'Outstanding Book Award' by the Indian Society of Agricultural Engineers (ISAE), New Delhi (2007) |
| 8.  | Prof. Hari Niwas Mishra     | President, Association of Food Scientists & Technologists (India) (2007)                          |
| 9.  | Prof. Sudhindra Nath Panda  | Fellow – Institution of Engineers (I) (2007)  |
| 10. | Prof. Virendra Kumar Tewari | ISAE Fellow Award, 2006 by Indian Society of Agricultural Engineers, New Delhi (2006)             |
| 11. | Prof. Virendra Kumar Tewari | ISTE Commendation Medal & Certificate for guiding Best M.Tech. Thesis 2006 (2007)                 |

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

- |     |   |                                       |
|-----|---|---------------------------------------|
| 1.  | ACOSINE-07 (Technologies for Rural Employment)                | January 19-21, 2007                   |
| 2.  | Advance Training in Agricultural Engineering (ATAE-07)        | June 25 – July 14, 2007               |
| 3.  | Awareness programme on microirrigation in Horticultural crops | April 14, 2007                        |
| 4.  | Drip and Sprinkler Irrigation                                 | October 30-31, 2006                   |
| 5.  | Drip and Sprinkler Irrigation                                 | February 8-9, 2007                    |
| 6.  | Drip and Sprinkler Irrigation                                 | June 14-15, 2007                      |
| 7.  | Microirrigation   | February 23-24, 2007                  |
| 8.  | Microirrigation and Greenhouse Technology                     | January 04, 2007                      |
| 9.  | Microirrigation and Greenhouse Technology                     | January 19-21, 2007                   |
| 10. | Microirrigation and Plasticulture Technology                  | June 07, 2007                         |
| 11. | Microirrigation   | December 12-13, 2006                  |
| 12. | Microirrigation and Greenhouse Technology                     | November 29-30, 2006                  |
| 13. | Microirrigation and Greenhouse Technology                     | January 29-30, 2007                   |
| 14. | Microirrigation for Fruit Crops                               | September 27-28, 2006                 |
| 15. | Microirrigation for Fruit crops                               | May 10-11, 2007                       |
| 16. | Microirrigation for Horticultural Crops                       | August 22-23, 2006                    |
| 17. | Microirrigation for Horticultural Crops                       | September 4-5, 2006                   |
| 18. | Microirrigation for Horticultural Crops                       | April 12-13, 2007                     |
| 19. | Plasticulture for Commercial Horticulture                     | August 16-17, 2006                    |
| 20. | Precision Farming in Horticulture                             | October 12-13, 2006                   |
| 21. | Rural Technologies for employemny generation                  | December 11-19, 2006                  |
| 22. | Technology Transfer for Rural Employment Generation           | December 11-17, 2006                  |
| 23. | Training Programme on Agri-clinics and Agri-business          | December 19, 2006 – February 18, 2007 |

## DEPARTMENT OF ARCHITECTURE & REGIONAL PLANNING

**HEAD : Professor Uttam K. Banerjee**

### FACULTY

#### Professor :

Banerjee, Uttam K.	B.Arch. (Hons.), MCP, Ph.D. (IIT Kharagpur), FITP, FIIA, MISTE, Architecture & Landscape Design, Urban Design, City Planning, Transportation Evaluation, Computer Applications and GIS, Building Automation, IT and Design Simulation
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.(Calcutta), MCP (IIT Kharagpur), AIIA, FITP, Urban Development Management, Planning Legislation, Metropolitan Planning, New Town Planning and City Planning

#### Associate Professor :

Barman, Jaydip	B.Arch. (Calcutta), MCP, Ph.D. (IIT Kharagpur), AIIA, FITP, AIIID, 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. (Calcutta), 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

#### Assistant Professor :

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

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 Planning, Architectural Heritage, Historic Research & Documentation, Settlement Dynamics

**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. Mokaddes Ali Ahmed            Assistant Professor  
Dr. Saikat Paul                            Assistant Professor

**Faculty Promotion :**

Prof. Arif N. Merchant                Professor  
Dr. Somnath Sen                        Associate Professor

**Faculty Retirement :**

Prof. Mridula Banerji                 Professor

**RESEARCH AND DEVELOPMENT**

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

The major areas of current Research & Development are :

1. Spatial Environmental Planning, Eco-sensitive and Green Architecture
2. Building Automation and Management Systems, Advanced Planning Informatics
3. Geographical Information Systems, Decision support systems and Expert systems
4. Transportation Planning, Traffic Engineering and Management
5. Energy Efficient Design
6. Graphic Design and Visual Communication, Visual Simulation and Multimedia
7. Indian Traditional Architecture and Heritage studies, Vernacular Architecture
8. Conservation and Preservation Studies
9. Urban Liveability and Systems Dynamics, Housing and Shelter, Social Infrastructure
10. Disaster Mitigation and Management
11. Eco-tourism, Recreation and Landscape Planning
12. Rural Planning and Management, Regional Studies and Forest Management.
13. Construction Management
14. Barrier-free design
15. Rainwater Harvesting

**Thrust Areas :**

1. Design education
2. Traditional Architecture & heritage studies
3. Environmental planning & design

4. Construction management
5. Graphics & Visual Communication
6. Disaster Management
7. Human settlements

**New Acquisitions :**

1. A first year laboratory for the Graphics and Visual Communication is now fully functional. It includes 40 high-end computers with high graphic ability, a high capacity server, 40 licensed Adobe and Macromedia software for all kind of graphic 2D and 3D multimedia and animation design. Video cameras and digital presenter, have also been procured for the new laboratory.
2. The Environment Laboratory has been enhanced with the functioning of Indoor and outdoor air quality measurement and data recorder (Dust track, data logger).

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Development of Women Technology Park in Nayagram Tribal Block, West Midnapore	DST, New Delhi	24.71 Lakhs
2.	Study of Ancillary Industry of POSCO-India	POSCO Research Institute	21.00 Lakhs
3.	National Programme for Capacity Building of Architects for Earthquake Risk Management	Ministry of Home Affairs New Delhi	25.45 Lakhs
4.	Historical Evolution of India - a new documentation	RKM Institute of Culture, Kolkata	3.00 Lakhs
5.	Technology Development and Transfer for Selected Medicinal Plants: Approach through T&D and Ex-situcultivation	National Medicinal Plants Board, New Delhi	15.00 Lakhs
6.	Technology for vermi-compost plant at Orgram, Burdwan	Navsakti Cements Pvt. Ltd., Kolkata	1.25 Lakhs

**Consultancy Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Population Holding Capacity of Hyderabad	Municipal Corporation of Hyderabad	17.50 Lakhs
2.	Preparation of City Development Plan for Burdwan Planning Area	Burdwan Development Authority, Burdwan	11.23 Lakhs
3.	Architectural Design for New Academic Complex at Bankura Unnayani Institute of Engineering	Bankura Unnayani Institute of Engineering, Bankura	8.97 Lakhs
4.	Preparation of Perspective Plan 2030 for Planning areas under ADDA and Burdwan Development Authority	Asansol Durgapur Development Authority	27.55 Lakhs

5.	Preparation of Perspective Plan - Vision 2030 and Comprehensive Development Plans for Plan Areas of Bhubaneswar & Cuttack Development Authority	Housing and Urban Development Department, Government of Orissa	165.29 Lakhs
6.	Preparation of Aizawl Master Plan	Aizawl Development Authority, Mizoram	70.22 Lakhs
7.	Preparation of Perspective Development Plan for Paschimanchal	Paschimanchal Unnayan Parishad, Govt. of West Bengal	11.02 Lakhs
8.	Preparation of Concept Note & EOI for establishment of Biotechnology Park at Kharagpur	West Bengal Industrial Development Corporation Ltd.	26.45 Lakhs
9.	West Bengal Coast Risk Assessment due to Tropical Cyclones	Department of Relief, Govt. of West Bengal	44.08 Lakhs
10.	Rapid Appraisal and Planning for Kulti and Panagarh	Asansol Durgapur Development Authority	5.05 Lakhs
11.	Mobility Improvement Plan for Asansol	Asansol Municipal Corporation	5.05 Lakhs

#### LECTURE BY VISITING EXPERT

1.	Mr. Anjan Mitra of The Appropriate Alternative, Kolkata	Workshop in Architectural Design Studio: "Mall Design"
2.	Mr. Debashish Paul, Architect-Planner, KMDA, Kolkata	Workshop in Architectural Design Studio: "Highway Mart Design"

#### INVITED LECTURES BY FACULTY MEMBERS

1.	Prof. R. N. Datta	"Urban Structure & Passenger Transportation" at Civil Engg. Department, IIT Bombay
2.	Dr. Somnath Sen	"RS & GIS assisted land Use Classification: ultimate Tool for Plan Implementation" at ORSAC, Bhubaneswar
3.	Joy Sen	"Indian Architecture" at UNESCO-IUHU course on International Understanding, at RKM Institute of Culture, Kolkata

#### BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	Prof. S. Basu	"Investigations of Historical Structures" in Structural Analysis of Historical Constructions	Macmillan India Ltd. (Advanced Research Series)	2007
2.	Prof. B. K. Sengupta, Prof. Joy Sen, and Haimanti Banerjee	History of Human Settlement (Readers Volume)	Institute of Town Planners, India	2007

- |    |               |   |                 |      |
|----|---------------|---|-----------------|------|
| 3. | Prof. Joy Sen | CONCEPT OF COMPLETE RELIGION - a key to unlock India's complete contribution to global systems of science, religion and culture | CYGNUS, Kolkata | 2006 |
|----|---------------|---|-----------------|------|

#### **LAURELS & DISTINCTIONS**

- |    |                      |  |
|----|----------------------|--|
| 1. | Dr. Jaydip Barman    | Elected as Fellow of Institute of Town Planners, India   |
| 2. | Prof. B. K. Sengupta | Selected as the Member of the Editorial Board : Spatio - Economic Development Record, Published by Dr. S.K. Kulshrestha (2006) |
| 3. | Prof. B. K. Sengupta | Selected as the Member of the Editorial Board : ABACUS, Published by BIT Mesra (2006)  |
| 4. | Prof. B. K. Sengupta | Member of the State Level Technical Committee for JNNURM, Government of West Bengal  |

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

- |    |   |                            |
|----|---|----------------------------|
| 1. | National Programme for Capacity Building of Architects for Earthquake Risk Management (NPCBAERM) as National Resource Institute, sponsored by Ministry of Home Affairs, Government of India | October 2006<br>(One week) |
|----|---|----------------------------|

## 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

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

#### Faculty Promotion :

Prof. Amit K. Das	Professor
Dr. Sudip K. Ghosh	Associate Professor

### 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 Biodiesel 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. 15. Biomaterials and tissue engineering.

#### Thrust Areas :

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

#### New Acquisitions :

1. High speed cold centrifuge;
2. Atomic absorption Spectrophotometer;
3. Stop flow device;
4. Nanodrop Spectrophotometer;
5. ELISA reader;
6. Gamma Counter.

#### ON-GOING RESEARCH PROJECTS

##### Sponsored Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	A study of microscale transport processes leading to the development of cooling strategy for electronic components	DIT	89.75 lakhs
2.	Amelioration of hydrogen production from sewage sludge using <i>Enterobacter Cloacae</i> IIT-BT 08	DBT	14.03 lakhs
3.	Baseline survey of microbial community structure present in uranium mine areas of UCIL Jaduguda, Jharkhand	DAE	23.62 lakhs
4.	Biohydrogen production by investigation on the hydrogenase coding gene of high yielding strain of <i>Enterobacter cloacae</i> IITBT08 in fast growing <i>E.coli</i>	USA	5.25 lakhs
5.	Bioinformatics SUB-DIC Programme	DBT	10.00 lakhs
6.	Bioprocess Development & Optimization for the production and characterization of a Biosurfactant of Marine origin for commercial & Health care Applica	DBT	34.85 lakhs



7.	Bioprocess Development and Optimization for the Production of an Anti-tumor Biosurfactant	IIT Kharagpur	3.00 lakhs
8.	Bioprocess Development, Optimization and Bioreactor Strategies for the Laboratory Scale Manufacture of Nutraceutical Formulations	CSIR	13.00 lakhs
9.	Bioremediation of nuclear wastes: removal of radionuclides/metals and degradation of organic contaminants	DAE	10.00 lakhs
10.	Characterization of silk protein sericin from Indian tropical tasar silkworms	DST	23.18 lakhs
11.	Characterization of two histidine kinases and their cognate response regulator involved in signal Transduction system of Mycobacterium tuberculosis	DBT	23.68 lakhs
12.	Cloning and characterization of a fungal protease inhibitor from the hemolymph of tasar silkworm <i>Antheraea mylitta</i>	ICMR	18.00 lakhs
13.	Comparative and evolutionary dynamics of repetitive DNA in Indian tropical tasar silkworm	CSIR	13.00 lakhs
14.	Crystal structure determination of a $\beta$ -Carbonic anhydrase (mCA) from Mycobacterium tuberculosis	DST	19.88 lakhs
15.	Development of silk proteins based biomaterials	DBT	28.00 lakhs
16.	Establishment of an in vivo Method for Detection of O-antigens in Gram-Negative Bacteria	DBT	21.00 lakhs
17.	Expression optimization and partial purification of soluble penicillin-binding protein 6 and fusion proteins of penicillin-binding protein 5 and 6 fro	IIT Kharagpur	3.00 lakhs
18.	Extraction characterization and optimised production of a natural dye from Amaranthus for commercial applications	DBT	24.40 lakhs
19.	FIST program in Biotechnology	DST	105.00 lakhs
20.	Functional characterization of soluble penicillin-binding protein 6 of E. coli	DST	21.38 lakhs
21.	Improvement of hydrogen production from industrial wastes using hybrid bioreactor	DBT	23.72 lakhs
22.	Institute Mission Project in Molecular Biotechnology	IIT Kharagpur	5.00 lakhs
23.	Maximization of gaseous energy recovery by simultaneous hydrogen production and biomethanation	DBT	21.55 lakhs
24.	Microbial removal of heavy metals and radionuclides from industrial wastes	DST	7.57 lakhs
25.	Microorganism based bioremediation of heavy metals and radionuclides containing wastes: understanding the mechanism and process development	CSIR	13.46 lakhs

26.	Modernization and up gradation of Biochemistry and Down stream processing Laboratory	MHRD	13.00 lakhs
27.	Molecular analysis of Antheraea mylitta cytoplasmic polyhedrosis virus genome segment 1 and 2	DST	19.74 lakhs
28.	Molecular characterization of microbial strains relevant to bioremediation (Institutional Scheme for Innovative R & D Indian Institute of Technology	IIT-Kharagpur	3.00 lakhs
29.	Molecular cloning and characterization of Antheraea mylitta cytoplasmic polyhedrosis virus genome segments 8 and 11	CSIR	10.70 lakhs
30.	Molecular epidemiology and identification of immunodominant antigen of Entamoeba in amoebic patients	ICMR	20.00 lakhs
31.	Optimisation of human fibroblast growth factors (diagnostic) production in recombinant plant cells in bioreactor	MHRD	12.00 lakhs
32.	Optimization and production of Antheraea mylitta cytoplasmic polyhedrosis virus anti-polyhedrin monoclonal antibody in bioreactor	MHRD	12.00 lakhs
33.	Optimization of recombinant protein production from hairy root/ calli clones	MHRD	14.00 lakhs
34.	Reconstruction of Epidermal and Dermal cells of skin in collagen three Dimensional Scaffold for Skin Tissue Engineering	DBT	23.92 lakhs
35.	Role of Penicillin-binding proteins and O-antigens in the development of beta-lactam antibiotic resistance in Gram negative bacteria	ICMR	13.00 lakhs
36.	Scale-up studies on production of hydrogen from Enterobacter cloacae IIT-BT 08	MNCES	24.90 lakhs
37.	Scale-up studies on the production of therapeutically important protein (FGF 8) by recombinant E. coli (Ministry of Human Resource Development	DST	12.00 lakhs
38.	Screening of Aloe vera L germplasms for cosmetic gel and micropropagation of elite clones	DST	14.58 lakhs
39.	Selection aided molecular marker system for improvement of tasar silkworm Antheraea mylitta drury sponsored by Central Silk Board	CSB	12.00 lakhs
40.	Silencing of gene expression in protozoan parasite Entamoeba histolytica by RNAi	CSIR	14.00 lakhs
41.	Structural and functional studies of major pathogenic proteins of M. tuberculosis (Part - II) (Indo-Norwegian Institutional Cooperation Programme	INICP	31.75 lakhs
42.	Studies on magnetic nanoparticle assisted hyperthermia activation of enediynes in cancer cells	DBT	29.61 lakhs

43.	Studies on the Fe-hydrogenase genes of prokaryotes and eukaryotes for the improvement of hydrogen production	DST-DAAD	3.92 lakhs
44.	Studies on the immunomodulatory properties of Aloe vera gel and its products	DARL	9.97 lakhs
45.	Synthesis characterization and application of surface functionalized magnetic metal nanoparticles for bioseparation and diagnostics	DBT	60.72 lakhs
46.	Technology development & transfer for selected medicinal plants: approach through R&D and ex-situ cultivation	NMPB	15.00 lakhs
47.	Understanding the signalling mechanism from the crystal structures of the two component system proteins and protein phosphatases of Mycobacterium tube	DBT	292.80 lakhs

#### Consultancy Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Establishment of Biotechnology Park Kharagpur: Concept paper	WBIDC	24.00 lakhs
2.	Herbal/ bioproduct development: preparation of preliminary report	B. Singha & Co	0.10 lakhs

#### VISITS ABROAD BY FACULTY MEMBER

1.	Prof. Subhas Chandra Kundu	Research work at Swiss Federal Institute of Technology, Lausanne,Switzerland.
2.	Prof. Subhas Chandra Kundu	Research work on stem cell (Tufts University, USA)
3.	Prof. Subhas Chandra Kundu	Research work : University of California, San Diego
4.	Prof. Subhas Chandra Kundu	Animal Models in Stem Research, Lausanne, Switzerland
5.	Prof. Subhas Chandra Kundu	Discussion Meeting with Professor D. Zickler (France, Paris University Sud.
6.	Prof. Subhas Chandra Kundu	To discuss with M.Tech student (Dresden, Technical University, Germany)
7.	Prof. Subhas Chandra Kundu	Discussion meeting with Professor Paolo Dario (Scuola Superiore Sant Anna, Pisa, Italy)
8.	Dr. Sudip Kumar Ghosh	Visiting Scientist (Boston University, Boston USA)
9.	Dr. Ramakrishna Sen	To present a paper in the 11 <sup>th</sup> International Conference on Environmental & Mineral Processing VSB- Technical University, Ostrava, Czech Republic)
10.	Dr. Ramakrishna Sen	To formulate an international project under the British Council UKIERI Programme (Royal Holloway University of London, UK)
11.	Dr. Ramakrishna Sen	To formulate an international project under the British Council UKIERI Programme (University of Ulster, Northern Ireland, UK)

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|-----|---------------------|--|
| 12. | Dr. Ramakrishna Sen | To deliver an invited lecture and discuss about joint collaborative research (University of London)                |
| 13. | Prof. Debabrata Das | Collaborative research work (University of Miami, USA)   |
| 14. | Prof. Debabrata Das | Invited lecture and collaborative research work (University of Aachen, Germany)                                    |
| 15. | Prof. Debabrata Das | Invited lecture and collaborative research work (Southern Illinois University, USA)                                |
| 16. | Prof. Debabrata Das | To give key-note lecture at the IHEC-2007 (Istanbul, Turkey)   |
| 17. | Prof. Satyahari Dey | Indo-Swiss Bilateral research initiative programme for exploring collaboration (Zurich, Trieste, Halle and Aachen) |

#### **LECTURE BY VISITING EXPERT**

- |     |   |   |
|-----|---|---|
| 1.  | Dr. N. Suryanarayana,<br>Director, CTR&TI, Ranchi                                       | Tasar sericulture in India  |
| 2.  | Dr.. G. R. Castro, National University<br>deLaPlanta, Argentina                         | Biopolymer control release of molecules   |
| 3.  | Dr. Prajjal Sinha, University of Texas Health<br>Science, Centre USA                    | Biopolymer control release of molecules   |
| 4.  | Dr. Ratna Roy, St. Louis University, USA  | Hepatitis C virus related pathogenesis  |
| 5.  | Dr. Sushil Mahato, University of California,<br>San Diego, USA                          | Hypertension and glucose homeostasis;<br>Insight from gene targeted mice and<br>human genomics                        |
| 6.  | Dr. Laura Poole-Warren, University of New<br>South Wales, Australia                     | Polymeric Biomaterilas: Tailoring systems<br>for drug delivery  |
| 7.  | Dr. Kakoli Bandopadhyay, Centre for<br>Diseases Control and Prevention, Atlanta,<br>USA | Application of luminex technology in<br>molecular diagnosis   |
| 8.  | Dr. Ashis Mondal, University of Arkansas<br>Medical Sciences, USA                       | Absence of <i>Drosophila melanogaster</i><br>GSTS-1 protein results massive muscle<br>degeneration and flightless fly |
| 9.  | Dr. Prabir K. Pal, Apex Instruments Co,<br>Kolkata                                      | Langmuir-Blodgett Technique: an useful<br>tool to study protein-lipid interaction                                     |
| 10. | Dr. Sujata Chatterjee, Mount Senai School of<br>Medicine,                               | Role of Sharp-1 in skeletal muscle<br>regeneration  |
| 11. | Dr. Simon Cutting, Royal Holloway University<br>of London, UK                           | Bacillus probiotics and vaccines  |

#### **INVITED LECTURES BY FACULTY MEMBERS**

- |    |                            |  |
|----|----------------------------|--|
| 1. | Prof. Subhas Chandra Kundu | Silk based 2-D films and 3-D scaffolds for biomedical application, Scuola Superiore Sant Anna)     |
| 2. | Prof. Subhas Chandra Kundu | Silk Protein based matrices for tissue regeneration and biomedical applications, EPFL, Switzerland |
| 3. | Prof. Subhas Chandra Kundu | Biopolymer in Drug Design and Drug Delivery, Calcutta University, Kolkata                          |

4.	Dr. Ramakrishna Sen	Microbial surfactants: potential therapeutic applications, School of Pharmacy, University of London, London
5.	Dr. Ramakrishna Sen	Biotechnological approaches towards Biodiesel production, National Institute of rural Development, (NIRD), Guwahari
6.	Prof. Debabrata Das	The Synergy of two-stage fermentation process: an approach towards amelioration of biohydrogen production, University of Aachen, Germany
7.	Prof. Debabrata Das	Biohydrogen production: a present state of art. Southern Illinois University, USA
8.	Prof. Debabrata Das	Biohydrogen as a renewable energy resource – prospects and potentials, Rajasthan University, Jaipur
9.	Prof. Debabrata Das	Biohydrogen as a renewable energy resource – present state of art, IIT-Delhi
10.	Prof. Debabrata Das	Biotechnological Applications in Food Processing, Jadavpur University, Kolkata
11.	Prof. Debabrata Das	Fermentative hydrogen production by <i>Enterobacter cloacae</i> : A few milestones and route towards commercial, Istanbul, Turkey
12.	Prof. Debabrata Das	Biohydrogen as a sustainable renewable energy resource: prospects and potentials, GHPCE, Anand, Gujarat
13.	Prof. Debabrata Das	Prospects of Biohydrogen production processes, MNNIT, Allahabad and Allahabad University.
14.	Prof. Ananta K. Ghosh	DNA replication, Vidyasagar University, Midnapore

#### THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	Chavali Venkata Ramana Murthy	Molecular Analysis of genome segments 6 and 7 of <i>Antheraea mylitta</i> cytoplasmic polyhedrosis virus
2.	Kaushik Nath	Studies on biological hydrogen production by two-stage fermentation process
3.	Nandita Mishra	Production and utilization of hairy root culture of <i>Catharanthus roseus</i>
4.	Monalee Saha	Molecular assessment of genetic variability in ecoraces of Indian tasar silkworm ( <i>Antheraea mylitta</i> )

#### PATENTS GRANTED

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

### **LAURELS & DISTINCTIONS**

1. Prof. Subhas Chandra Kundu Fellow, West Bengal Academy of Science and Technology
2. Prof. Amit K. Das Fellow, West Bengal Academy of Science and Technology

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

1. Bioinformatics in Genomics and Proteomics 2 days

## 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
Saha, Ranajit Kumar	Ph.D. (IIT Kharagpur), Combustion Engineering, Fuels & New Energy Conversion Processes, Fluidization 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 modelling, simulation
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, USA), RF Plasma Processing, Plasma Deposition, Material Syntheses using RF Plasma, Chemical Vapor Deposition, Plasma Processing for Biomed Application
Neogi, Swati	Ph. D. (Ohio University), Polymer Application Research, Composite manufacturing technology, Materials development, Fiber optics Cable design, Polymer fracture analysis / durability study, Flame retardant materials development
Patwardhan, Anand Vinayak	Ph.D. (UDCT Mumbai), Green Technology, Mass Transfer Operations, Heterogeneous Reactions, Microchannel Reactors

**Assistant Professor :**

Bhattacharya, Debaprasad	Ph.D. (IIT Kharagpur), Reaction Engineering, Project Engineering, Biogas
Chakrabarty, Saikat	Ph.D. (University of Houston), Chemical Reaction Engineering, Biomedical Engineering
Ganguly, Somenath	Ph.D. (University of Kansas, USA), 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

**Scientific Officer :**

Brahma, Nitosh Kumar	Gas-Hydrate and its Physio-chemical properties, Bio- chemical-Microb-Engineering & Biotechnology, Nano-biotech and Biol. Env. Pollution control, Organic and Bio-chemistry in CEP
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**FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION****Faculty Appointment :**

Prof. Somnath Ganguly	Assistant Professor
Prof. A. K. Jana	Assistant Professor

**Faculty Promotion :**

Prof. N. C. Pradhan	Professor
Prof. S. De	Professor
Dr. Swati Neogi	Associate 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

**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
6. Multi-phase processes & reactions in gas-liquid, liquid-solid, solid-liquid and liquid-liquid systems using pipelines, ejector based systems, fluidized bed, column flotation etc.
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.)
9. Development & performance of novel bubble column scrubber/reactor for removal of SO<sub>2</sub> and fly ash
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 microreactor
10. Manufacture and testing of Polymer Composites.

**New Acquisitions :**

1. Hydraulic Press for Compression Moulding of Polymer Composites
2. UV Spectrophotometer
3. Gas Chromatograph
4. Centrifugal Pump Testing
5. Pitot Tube
6. Liquid Fluidized Bed
7. Bernoulli's Apparatus
8. Shell and Tube Heat Exchanger
9. Vapor-liquid equilibrium Data Collection Cell
10. Vapor Diffusion Cell
11. Bubble Column Reactor
12. Column Flotation cell

13. Development of Multiphase Flow Laboratory in Chemical Engg Deptt
14. Mixed Reactor
15. Rotational Viscometer

#### ON-GOING RESEARCH PROJECTS

##### Sponsored Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Investigations on oil-water core-annular flow through experiments and theoretical analysis for the production and processing of heavy oils	IIT, Kharagpur	1.00 Lakh
2.	A Study of Microscale Transport Processes leading to the Development of a Cooling Strategy for Electronic Components	DIT, Government of India	89.75 Lakhs
3.	Abatement of Dust, SO <sub>2</sub> and NO <sub>x</sub> by Wet Scrubbing Process	MHRD	8.00 Lakhs
4.	Ammonia Production by using Urea for Flue Gas Conditioning	NTPC Limited, New Delhi	65.00 Lakhs
5.	Bio Gas development & training Centre	Ministry of New & Renewable Energy	6.00 Lakhs
6.	CFD and experimental study of multi-phase systems (solid-liquid and gas-liquid)	IIT Kharagpur	3.00 Lakhs
7.	Composite Applications Laboratory	TIFAC, DST, New Delhi	346.20 Lakhs
8.	Computational fluid dynamics modeling and flow visualization of a gas liquid mixture through a nozzle and subsequent spray	MHRD, Govt. of India	9.00 Lakhs
9.	Design of bench scale unit for chemical beneficiation	Tata Steel	15.00 Lakhs
10.	Development and characterization of a high efficiency wet scrubber with internals for air pollution control	IIT Kharagpur	3.00 Lakhs
11.	Development of client server and GUI based optimization and control network for utilization in the chemical leaching pilot plant of Tata Steel	Tata Steel Limited, Jamshedpur	11.60 Lakhs
12.	Development of experimental setup and study on upgradation of high ash Indian coal	Tata Steel, Jamshedpur	15.00 Lakhs
13.	Development of microgrooved heat pipes: performance modeling and experimental validation	BRNS (Board of Research in Nuclear Sciences)	10.00 Lakhs
14.	Development of new regeneration process with the chemical leaching circuit to upgrade high ash Indian coal	Tata Steel Limited, Jamsedpur	13.00 Lakhs
15.	Development of optimally controlled drug release device using multilayered electroactive nanopolymers	Department of Biotechnology, Govt. of India	28.60 Lakhs

16.	Development of sensors for gas-liquid and liquid-liquid two phase flow	MHRD	14.00 Lakhs
17.	Flow visualization and theoretical prediction of transition criteria during up flow of liquid-liquid and gas-liquid-liquid mixtures through Vertical and inclined conduits	DST (Fast Track Scheme for Young Scientists Scheme)	7.32 Lakhs
18.	Flux enhancement and fouling reduction during effluent (leather and dye) treatment using membrane separation	Department of Science and Technology	21.40 Lakhs
19.	Formation of Ordered Meso-patterns using Interfacial Instability and Dewetting of Conducting Polymers	DST, Govt. of India	23.58 Lakhs
20.	Hydrodynamic study of Vortex and air-core formation in a two phase flow for simple geometries	Tata Steel, Jamshedpur	2.20 Lakhs
21.	Hydrodynamics Studies on Micro Bubble Generators	Tata Steel, Jamshedpur	4.62 Lakhs
22.	Micellar enhanced ultrafiltration for removal of organic and inorganic pollutants from aqueous streams	DST, Govt. of India	10.00 Lakhs
23.	Natural gas processing: Removal of carbon dioxide from sour gas streams	MHRD	12.00 Lakhs
24.	Performance study of a hydrocyclone	Tata Steel, Jamshedpur	8.00 Lakhs
25.	Process development and engineering analysis of greener routes for commercially important organic diisocyanates, and epoxidised non-edible oils	IIT, Kharagpur	3.00 Lakhs
26.	Removal of Toxic Dyes from Industrial Effluent using a Copmbination of Adsorption and Membrane Separation Process	MHRD	8.00 Lakhs
27.	Studies in Reforming of Methane to Synthesis Gas using Microreactor for production of Hydrogen	Department of Fertilizers, Govt. of India	56.00 Lakhs
28.	Studies on alkylation reactions of aromatics, alcohols and alpha-olefins using zeolite catalysts to produce industrially important petrochemicals	IIT, Kharagpur	2.90 Lakhs
29.	Studies on Effective Use of Microwave Energy for Green Mineral Beneficiation and Pipe Line Slurry Transport	CSIR, New Delhi	13.30 Lakhs
30.	Studies on In-situ Reaction and Separation of Steam Reforming Product Mixtures in a Membrane Reactor	Department of Fertilizers, Govt. of India	71.53 Lakhs
31.	Surfactant based separation processes for the treatment of industrial effluent	MHRD	13.00 Lakhs
32.	Synthesis & Characterization of Semiconducting Polymers	IIT, Khagagpur	3.00 Lakhs

33.	Synthesis & Engineering of Advanced Materials Using RF Plasma for Chemical, Microelectronic, Biochemical and Biomedical Applications	DST	58.13 Lakhs
34.	Treatment of leather plant effluent using membrane based separation processes	IIT Kharagpur	1.00 Lakhs
35.	Utilization of Hydrogen Sulphide for the Production of Value-Added Chemicals	CSIR, New Delhi	11.96 Lakhs
36.	Water lubricated transport of heavy oils – experimentation and theory	DST	19.00 Lakhs

**Consultancy Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Analysis of Blast Furnace Gas	Tata Metalliks, Kharagpur	0.11 Lakhs
2.	Behavior of coating on optical fiber performance	Sterlite Optical Technologies	0.30 Lakhs
3.	Consultancy input for Data Acquisition and Control at Tata Steel	Tata Steel	2.00 Lakhs
4.	Consultancy Input for design and optimization & evaluation of Technoeconomics	Tata Steel, Jamshedpur	9.17 Lakhs
5.	Consultancy input for design and scaling up of a novel coal treatment process	Tata Steel, Jamshedpur	9.00 Lakhs
6.	Consultancy Input for design of operator station with structured database for pilot unit	Tata Steel Jamshedpur	6.25 Lakhs
7.	Consultancy Input on Design and Hydrodynamics Studies of Micro Bubble Generator	Tata Steel, Jamshedpur	2.50 Lakhs
8.	Design and development of a mathematical model for ultra fast cooling of steel strips	Tata Steel, Jamshedpur	5.61 Lakhs
9.	Design of an Industrial Scale Hydrocyclone	Tata Steel, Jamshedpur	2.70 Lakhs
10.	Development of Software For Design Of Two Phase Flow System With Simple Geometries	Tata Iron & Steel Company Ltd., Jamshedpur	2.12 Lakhs
11.	Development of Synthetic Resins	Suparna Chemicals Limited, Mumbai	4.00 Lakhs
12.	Examination of LABSA Manufacture at Haldia by M/s Tata Chemicals	Tata Chemicals Ltd., Durgachak, Haldia	0.53 Lakhs
13.	Exploratory Work on Dry Beneficiation of Iron Ore and Coal Fines	Tata Steel	2.97 Lakhs
14.	Lime Calcination project at TISCO	TISCO	2.00 Lakhs
15.	Optical fiber cable design & process	Sterlite Optical Fiber Technologies Limited	0.30 Lakhs

16.	Scoping Study for development of Chemical Leaching pilot plant for Tata Steel	Tata Steel Jamshedpur	3.00 Lakhs
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#### **VISITS ABROAD BY FACULTY MEMBER**

- |    |                              |  |
|----|------------------------------|--|
| 1. | Dr. Anand Vinayak Patwardhan | Oral presentation of two technical papers based on the research work of Research Scholars (Kuala Lumpur Convention Center, Malaysia), August 27-30, 2006 |
| 2. | Dr. Bhim Charan Meikap       | To Present a technical paper (The Institution of Engineers, Malaysia), August 26-30, 2006  |
| 3. | Dr. Bhim Charan Meikap       | Visitor to Interact with Faculty and R&D Discussions (University Technology Petronas (UTP), Malaysia), August 29, 2006                                   |

#### **LECTURE BY VISITING EXPERT**

- |     |  |   |
|-----|--|---|
| 1.  | Prof. G. D. Yadav (Head, Dept. of Chemical Engg. & Dean (RCRM), UICT, Bombay University, Matunga, Mumbai)  | Chemical Engineering as God's Profession  |
| 2.  | Prof. T. Alan Hatton (Ralph Landay Prof. of Chemical Engg. Practice & Director, David H. Koch School of Chemical Engg. Practice, MIT, Cambridge, Massachusetts, USA) | Photoresponsive Surfactants: Mediation of Interfacial and Bulk Solution Properties using Light    |
| 3.  | Dr. U. K. Dutta (Managing Director, The Technomanage Group, Faridabad)   | The Journey of an ex-IITan (Chemical Engg. as a Career with Real Life Stories from Industry)      |
| 4.  | Dr. Ravi Kant Pathak (PDF, Dept. of Chemical Engg., Carnegie Mellon University, Pittsburgh, USA)   | Secondary Organic Aerosol Formation in Atmosphere for the Biogenic Emissions from Trees           |
| 5.  | Dr. (Ms.) Sudipta Chattopadhyay (Senior Resaerch Engineer, Catacel Corporation, Garrettsville, Ohio, USA)  | High Temperature Catalysis in Multifunctional Reactors  |
| 6.  | Prof. Partha S. Ray (Professor, Dept. of Chemical Engg., UCST, Calcutta University, Kolkata)   | Chemical Engineering : Past, Present and Future   |
| 7.  | Prof. Sandip Roy (Associate Professor, Dept. of Chemical Engg., IIT, Bombay)   | Risk-based Decision making for Process Safety Management : Case Studies                           |
| 8.  | Dr. Amitava Sarkar (Associate Engineer III, CAER, University of Kentucky, USA)   | Energy Efficient Processes  |
| 9.  | Mr. Partha S. Deb (VP, Reliance Industries Ltd., Mumbai)   | Oil-refinig Technology & Oil-refining Scenario in India   |
| 10. | Dr. Dibakar Das (PDF, University of Cincinati, USA)  | Synthesis and Characterization of Diamond Thin Film for High Performance Electronics Applications |

## INVITED LECTURES BY FACULTY MEMBERS

1. Dr. Bhim Charan Meikap Air Pollution Control In Chemical Process Industries By Wet Scrubbing Process (JITM, Paralakhemundi for National Conference on Technology For Sustainable Utilization of Natural Resources, Tech SUNR 2007)
2. Dr. Bhim Charan Meikap Keynote Lecture, National Conference on "Pollution Control in Chemical and Related Industries" (Stanley College of Engineering and Technology, Hyderabad)
3. Dr. Bhim Charan Meikap To Grace the Occasion as "Guest of Honour" (GIET , Gunupur, International Conference on "Impact of Industrialization on Environmental Pollution - Its Control Abatement")
4. Prof. Sirshendu De Membrane Technology (JNTU, Anantapur)
5. Prof. Sirshendu De Application of membrane technology (Haldia Institute of Technology)
6. Dr. Kajari Kargupta Controlled Morphological Phase separation and Patterning in liquid thin films (Indian Institute of Technology, Chennai)
7. Dr. Saibal Ganguly Real time Simulation of Petroleum based Industrial flowsheets (NMRL, DRDO, Mumbai)
8. Dr. Saibal Ganguly Scoping Study for scale up of the Chemical Leaching pilot unit (Tata Steel, Jamshedpur)
9. Dr. Saibal Ganguly Basic & detailed engineering design of Coal upgradation pilot unit (ARDEE R&D Centre, Vishakapatnam)
10. Dr. Saibal Ganguly Computer based simulation of multistage separation processes (HIT Haldia)
11. Dr. Saibal Ganguly Real time simulator & control of Chemical Industrial units (HIT Haldia)
12. Dr. Saibal Ganguly Real-time Process Intelligence for specialized industrial reactor systems (HIT Haldia)
13. Dr. Saibal Ganguly Intelligent Instrumentation for Process Industries (Asansol Engineering College)

## THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	Dhurjati Prasad Chakrabarti	The Hydrodynamics of Liquid-Liquid Two Phase Flow through Horizontal Pipeline
2.	Vaibhav Vasant Goud	Heterogeneous Reactions (Epoxidation of Non-edible Vegetable Oils : Development of Value-added Products from Renewable Natural Resources
3.	Sanghamitra Barman	Alkylation of Aromatics with Alcohols and Acetone over Modified Zeolites

## PATENTS GRANTED

1. Dr. A. V. Patwardhan A meso-channeled, structured catalyst (PS-CAT) for steam reforming of methane for production of syngas

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|----|---|---|
| 2. | Dr. B. C. Meikap &<br>Dr. Sudipto Chakraborty | A Method For Suppressing Air Core in Hydrocyclones and Dense Medium Cyclones  |
| 3. | Prof. S. Dasgupta                             | A method of separation of pectin during membrane clarification of fruit juice for productivity improvement                            |
| 4. | Prof. N. C. Pradhan                           | A Process for the Manufacture of Polyurethaneurea   |
| 5. | Prof. S. De                                   | Electric field assisted membrane separation of pectin   |
| 6. | Dr. B. C. Meikap                              | Improved Wet Scrubber for Simultaneous Scrubbing of Particulate and Gaseous Matters in a Gas-Liquid, Gas-Liquid-Solid Contacting Unit |
| 7. | Prof. S. De & Prof. S. Dasgupta               | Membrane Based Water-Extraction of Polyphenols from Green Tea leaves  |
| 8. | Prof. G. Das                                  | Optical Probe for Multiphase Flow   |

#### **LAURELS & DISTINCTIONS**

- |    |                          |   |
|----|--------------------------|---|
| 1. | Dr. Bhim Charan Meikap   | Biography included in Who's Who in the World (2006)                         |
| 2. | Prof. Dibyendu Mukherjee | Institution Prize by The Institution of Engineers (India)(2006)             |
| 3. | Prof. Dibyendu Mukherjee | Sir Ganga Ram Memorial Prize by the Institution of Engineers (India) (2006) |
| 4. | Dr. Gautam Kundu         | Sir Ganga Ram Memorial Prize (2006)   |
| 5. | Dr. Gautam Kundu         | The Institution Prize (2006)  |

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

- |    |  |                       |
|----|--|-----------------------|
| 1. | ChemInsight 2007                         | March 16-8, 2007      |
| 2. | Workshop on Filament Winding Technology  | April 12-3, 2007      |
| 3. | Workshop on Resin Transfer Molding (RTM) | September 14-16, 2006 |

## 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. (Bombay), Theoretical Chemistry, Quantum Chaos, Quantum Toxicology
Mal, Dipak Ranjan	Ph.D. (Missouri), Organic chemistry
Pathak, Tanmaya	Ph.D. (Uppsala Sweden), Bioorganic Chemistry
Paul, Tarasankar	Ph.D. (Burdwan University), Inorganic Chemistry
Pramanik, P	Ph.D. (IIT Kharagpur), Nano Materials, Material Chemistry, Advanced Ceramic, Optical Materials, Catalyst, Mesoporous Material
Ray, Debashis	Ph.D. (Jadavpur University), Synthetic Inorganic Chemistry, Metallocrown 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. (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., Organometallic Chemistry, Synthetic Organic chemistry, Homogeneous Catalysis
Nag, Ahindra	Ph.D. (Jadavpur University), Bio organic Chemistry
Nanda, Samik	Ph.D. (IICT, Hyderabad). Organic Chemistry
Singh, Pradeep N.D	Ph.D. (Madras University). Organic Photochemistry
Raj, C Retna	Ph.D., Biosensor, Nanomaterials, Electroanalytical Chemistry

**Visiting Faculty :**

Dhara, Dibakar	Ph.D. (Osmania Univrrsity), Polymer, Physical Chemistry
Rajakumar, A	Ph.D., Environmental Analytical Chemistry

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

**Faculty Appointment :**

Dr. G. Mani	Assistant Professor
Dr. Samik Nanda	Assistant Professor
Dr. Mintu Halder	Assistant Professor
Dr. Pradeep N. D. Singh	Assistant Professor
Dr. Dibakar Dhara	Visiting Assistant Professor
Dr. A. Rajakumar	Visiting Assistant Professor

**Faculty Promotion :**

Prof. Debashis Ray	Professor
Prof. Suneel Kumar Srivastava	Professor
Prof. Manish Bhattacharjee	Professor
Dr. Sanjoy Bandyopadhyay	Associate Professor
Dr. Srabani Taraphder	Associate Professor
Dr. Swagata Das Gupta	Associate Professor
Dr. Joykrishna Dey	Associate Professor
Dr. Saumen Hajra	Associate Professor
Dr. Ahindra Nag	Assistant Professor

## 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 Bruker-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, Chrompac Gas Chromatograph and JASCODIP 30 digital polarimeter, Spex Fluorolog 3 fluorimeter, and a Perkin Elmer C240 CHN Analyzer. Active research in synthetic organic 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, furoterpenes, lactams and heterocyclic quinonoids. Enzyme mediated synthesis and a substrate analog approach to determine the active site of enzymes is being studied as is the enzyme inhibition approach to drug design. Isolation and characterization of an angiogenic protein is in progress with an aim to determine the specificity by studying several dinucleotide substrates. Supramolecular chemistry relating to 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. 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 I 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 paramagnetic cluster complexes,
2. Ligand design and synthesis,
3. Drug design.

### New Acquisitions :

1. Bruker AXS CCD single crystal X-ray diffractometer,
2. Two Perkin-Elmer RX1 FT-IR spectrometer,
3. Sherwood magnetic susceptibility balance,
4. CH Electrochemistry system,
5. Potentiometric Titration Apparatus.

## ON-GOING RESEARCH PROJECTS

### Sponsored Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	A conceptual DFT approach towards metal toxicity	BRNS, Mumbai	7.00 Lakhs
2.	Application of high resolution NMR spectroscopy in complex chemical and biochemical systems	DST, New Delhi	198.00 lakhs
3.	Asymmetric Methods for the Synthesis of Substituted Butyrolactones: Enantioselective Synthesis of Biologically Active Compounds	CSIR, New Delhi	6.50 Lakhs
4.	Catalyst Designing and its Application in Organic Synthesis	IIT Kharagpur	5.00 Lakhs
5.	Catalytic and Enantioselective 1,2-Halo-Nucleophilic Addition Reactions of Alkenes	DST, New Delhi	23.12 Lakhs
6.	Design of Organic-Inorganic Hybrid Materials with Porous and / or Chiral Properties	DST, New Delhi	18.72 Lakhs
7.	Crystal Engineering Studies on Derivatives Containing 2° Amide and Pyridine Functional Groups: Design and Applications	CSIR	11.46 Lakhs
8.	Combinatorial biocatalysis: Generation of compound libraries based on small molecule scaffold, taking the lead from nature	DST, IIT Kharagpur	20.00 Lakhs
9.	Computer simulation studies of the effect of ethanol on biomembranes	DST, New Delhi	6.00 lakhs
10.	Computer simulations of aqueous protein solutions: A study on the role of biological water	DBT, New Delhi	6.00 lakhs
11.	Cooperative Bimetallic Catalysis	DST, New Delhi	3.00 Lakhs
12.	Development of electrochemical sensor based on thin films	DST, New Delhi	11.14 Lakhs
13.	Design of Inhibitors of Angiogenin, a Blood Vessel Inducing Protein	MHRD, New Delhi	11.00 Lakhs
14.	Development and characterization of semiconducting nano tubes and nanorods for thermoelectric applications	DST, New Delhi	17.00 Lakhs
15.	Development of Thick-Film Gas Sensors Using Nanosized, Perovskite and Pyrochlore Type Composite Oxides	DAE, New Delhi	19.43 Lakhs
16.	Development and characterization of nanofillers in for polymer composites	MHRD, New Delhi	20.00 Lakhs
17.	Development and characterization of semiconducting thin films of layer transition metal dichalcogenides	CSIR, New Delhi	10.46 Lakhs

18.	Development of Quantum Chemical Descriptors for Probing Toxicity of Various Chemicals: A Density Functional Approach	CSIR, New Delhi	12.20 Lakhs
19.	Development of nanostructured transducer for amperometric and microgravimetric applications	DST, New Delhi	34.14 Lakhs
20.	Development and characterization of nanofillers in for polymer composites	MHRD, New Delhi	20.00 Lakhs
21.	Development and characterization of semiconducting nano tubes and nanorods for thermoelectric applications	DST, New Delhi	17.00 Lakhs
22.	Development and characterization of semiconducting thin films of layer transition metal dichalcogenides	CSIR, New Delhi	10.46 Lakhs
23.	Development and characterization of organic polymer-inorganic materials nanocomposites	CSIR, New Delhi	6.60 Lakhs
24.	Early Transition Metal Catalysts for Aqueous Medium (DST)	DST, New Delhi	24.00 Lakhs
25.	Enantioseparation of Drugs and Small Organic Molecules by Electrokinetic Capillary Chromatography Using Vesicles as Pseudo-stationary Phase	CSIR, New Delhi	7.50 Lakhs
26.	Epoxy-reinforced inorganic material filled organic polymer composites in tribological applications	DRDO, New Delhi	24.60 Lakhs
27.	Fluorescence probe studies of the structure, aggregation mechanism and microenvironments of chiral polysoaps and block ionomers in solution	CSIR, New Delhi	
28.	Generation & reactivity of bimetallic tin-transition metal complexes	CSIR, New Delhi	Rs. 3.00 Lakhs
29.	Hyperthermia on Eneidyne	DBT, New Delhi	
30.	Inhibition of the ribonucleolytic activity of angiogenin with backbone modified dinucleotides: a new approach to cancer chemotherapy	DST, New Delhi	
31.	Interactions of hydrophobically odified water-soluble polymers with surfactants: Fluorescence probe and light scattering studies	MHRD, New Delhi	
32.	Inhibition of the ribonucleolytic activity of angiogenin with backbone modified dinucleotides: a new approach to cancer chemotherapy	DST, New Delhi	24.68 Lakhs
33.	Isolation and characterization of angiogenin from goat plasma: a study on the effect of green tea components on angiogenin induced angiogenesis	CSIR, New Delhi	8.68 Lakhs

34.	Interactions Between Water-Soluble Hydrophobically Modified Polymers and Surfactants: Rheology, Fluorescence Probe, and Calorimetric Studies.	BRNS, DAE, New Delhi	14.90 Lakhs
35.	Lewis Acid Promoted Stereoselective Radical Cyclization: Application in Organic Synthesis	CSIR, New Delhi	10.38 Lakhs
36.	Magnetic Field Effect on Radical-pair Recombination in Chemical and Bio-chemical Systems: An Optical Spectroscopic Study	DST, New Delhi	15.70 Lakhs
37.	Molecular dynamics simulations of surfactant monolayers at the air/water interface	CSIR, New Delhi	8.00 lakhs
38.	Mono-, Di- and Bisvinyl Sulfone-Modified Carbohydrates as Versatile Synthons: A New "Chiron Approach to Heterocycles, Carbocycles, Sugar Cluster	DST, New Delhi	
39.	Mono and Bimetallic Reagents and Intermediates of Silicon: Mechanistic Investigation and Synthetic Application	DST, New Delhi	22.00 Lakhs
40.	Palladium catalysed tandem oxidative cyclisation reaction for the synthesis of cycloalkenones en route to natural products	CSIR, New Delhi	9.96 Lakhs
41.	Physico-Chemical Characterization of Metal Based Drugs		20.00 Lakhs
42.	Preparation and Tribological Properties of MoS <sub>2</sub> -Graphite-Viton Nanocomposites	DST, New Delhi	9.55 Lakhs
43.	Preparation of Nanocomposites of Ferroelectric Materials with Polymer for Super Capacitors	DRDO, New Delhi	12.31 Lakhs
44.	Processing and Performance of Biodiesel	DST, New Delhi	19.00 Lakhs
45.	Production of Lipase and its application	DBT, New Delhi	25.00 Lakhs
46.	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	13.60 Lakhs
47.	Size & shape controlled mono-& bimetallic nanoparticles synthesis for sensing org. & important biomolecules in diff.organized media	DST, New Delhi	76.03 Lakhs
48.	Studies on the electrocatalytic properties of mono and bimetallic nanoparticles	CSIR, New Delhi	9.50 Lakhs
49.	Synthesis of Inorganic Fullerene-type MoS <sub>2</sub> and WS <sub>2</sub> Nanoparticles and Study of their Lubrication Properties	IIT Kharagpur	4.15 Lakhs
50.	Synthesis, Structure and Reactivity of Bimetallic Complexes by using Metalloligands	CSIR, New Delhi	9.45 Lakhs

51.	Synthesis of Nano-sized Inorganic oxides and their Solid Solutions and Studies of their Properties	IIT Kharagpur	0.50 Lakhs
52.	Photoinduced electron and energy transfer of some organic molecules in biologically relevant organized media	DST, New Delhi	38.50 Lakhs
53.	Physico-Chemical Properties of Ayurvedic Metal-Based Drug: A Case Study on Rasasindu	DST, New Delhi	20.00 Lakhs
54.	Preparation of Stable Vesicles of Catanionic Surfactants. Characterization by Surface Tension, Fluorescence Probe, Light Scattering, and Microscopi	DST, New Delhi	24.00 Lakhs
55.	Preparation and Tribological Properties of MoS <sub>2</sub> -Graphite-Viton Nanocomposites	DST, New Delhi	
56.	Preparation and Characterization of Solid Solution of Bismuth Oxide based Nanocrystalline Layered Perovskites	DST, New Delhi	9.46 Lakhs
57.	Recycling Of Plastics	IIT Kharagpur	3.00 Lakhs
58.	Screening for hydroxynitrile lyase from cyanogenic plant species in indian subcontinent: their application in asymmetric organic synthesis	IFS, Sweden,	5.00 Lakhs
59.	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	13.60 Lakhs
60.	Spectroscopic Study of Solvation dynamics and Photochemical reactions in solution and organized assemblies	CSIR, New Delhi	10.70 Lakhs
61.	Studies on the interaction of dinucleotides on an angiogenic protein from goat plasma	DST, New Delhi	9.09 Lakhs
62.	Studies on copper complexes of green tea polyphenols and and their effects on the activities of ribonuclease A and angiogenin	CSIR, New Delhi	8.20 Lakhs
63.	Study of ultrafast processes in ionic liquid containing micro hetero geneous media	CSIR, New Delhi	6.16 Lakhs
64.	Studies on the electrocatalytic properties of mono and bimetallic nanoparticles	CSIR, New Delhi	
65.	Synthetic studies towards fused and bioactive gamma lactam derivatives: conversion of gamma lactam carboxylic acids to N-aryl formylpyrroles and synthe	DST, New Delhi	23.61 Lakhs
66.	Synthesis and Biological Studies of Azido and Aminohexopyranosyl Nucleosides and Aminohexopyranose Containing Oligomers: Towards New Classes of Antivi	Indo-French Centre for the Promotion of Advanced Research	

67.	Synthesis of Nano-Sized Titanium Dioxide from Naturally Available Ilmenite Ores	DST, New Delhi	19.20 Lakhs
68.	Studies on Supramolecular Interactions for Development of Chemical Sensors of Toxic Chemicals	DRDO, New Delhi	30.00 Lakhs
69.	Synthesis of Nano-Sized Metastable Oxide Solid Solutions and Studies of their Properties	IIT Kharagpur	38.43 Lakhs
70.	Synthesis of Inorganic Fullerene-type MoS <sub>2</sub> and WS <sub>2</sub> Nanoparticles and Study of their Lubrication Properties	IIT Kharagpur	
71.	Synthetic Studies of Wortmannin, A Toxic Steroidal Metabolite	CSIR, New Delhi	
72.	Theoretical Modelling of the Role of Hydration in Proton Transfer Processes in Proteins	CSIR, New Delhi	9.51 Lakhs
73.	Theoretical Investigations on the Structure and Dynamics of Liquids under Pressure (Department of Science and Technology)	DST, New Delhi	15.60 Lakhs
74.	Transition-metal catalyzed activation of C(aryl)-Cl bond and its application in C-N, C-O and C-S bond forming reactions (SERC Fast Track Scheme for Young Scientists)	DST, New Delhi	19.20 Lakhs
75.	Toxicity of Beauty Care Products (consultancy project)	Procter & Gamble, USA	
76.	Titanocene (III) catalyzed Radical Reactions: Stereoselective Formation of C-C Bonds	DST, New Delhi	9.36 Lakhs
77.	Total Synthesis of Chrymutasins	DST, New Delhi	23.00 Lakhs
78.	Use of Kinugasa Reaction for the Synthesis of Heterocycle-Enediyne Chimera	DST, New Delhi	
79.	Upgrading Raman Spectrometer to Micro-Raman Spectrometer for Studies on Bio-materials	DRDO, New Delhi	49.79 Lakhs
80.	White Biotechnology: Biocatalysis using enzymes and microorganisms, synthesis of fine chemicals and APIs.	CSIR, New Delhi	11.50 Lakhs

**Consultancy Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	FRP in Indian Railways Joint Venture and Outsourcing	M/s Synthetic Moulders Ltd., Kolkata	
2.	Laboratory preparation of DIBOC	Suparna Chemicals Limited, Mumbai	

#### VISITS ABROAD BY FACULTY MEMBER

1. Prof. D. Ray Invited talk in 1<sup>st</sup> Asian Conference on Coordination Chemistry, Okazaki, Japan (July 29 – August 2, 2007)
2. Dr. S. Bandyopadhyay Invited lecturer for the Spring College on "Water in Physics, Chemistry and Biology", The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy (April 10-20)
3. Prof. T. Pal Visiting Professor, Bayreuth, Germany
4. Prof. T. Pal Visiting Professor, University of Manchester, UK
4. Prof. T. Pal Visiting Professor, IMS, Okazaki, Japan
5. Prof. T. Pal Visiting Professor, NIMS, Italy
6. Prof. T. Pal Visiting Professor, Georgia Institute of Technology, USA
7. Prof. T. Pal Visiting Professor, Tokyo University of Science, Japan
8. Prof. T. Pal Visiting Professor, National University of Taiwan, Taiwan
9. Prof. T. Pal Visiting Professor, University of Paris-Sud, France
10. Prof. T. Pal Visiting Professor, University of Kent, UK
11. Prof. T. Pal Visiting Professor, Oak Ridge National Lab, USA
12. Dr. S. Hajra Alexander von Humboldt Fellow (resumption of fellowship), University of Regensburg, Regensburg, Germany (May-June)
13. Dr. C. Retna Raj Research-Visiting Scientist, Taiwan (June 1 – July 15, 2007)
14. Prof. J. K. Ray Collaborative research, Australian National University, Canberra, Australia (8 weeks)
15. Prof. S. K. Srivastava Research, University of Nantes (May 12 – July 14, 2007)
16. Dr. S. Taraphder Regular Associate, International Centre for Theoretical Physics, Trieste, Italy (April 2007)

#### LECTURE BY VISITING EXPERT

1. Prof. Anil Kumar Singh, Department of Chemistry, IIT Bombay Chemistry of Some Linear Polyene-Based Natural Photoreceptors
2. Prof. S. Chandrasekaran, Department of Inorganic and Physical Chemistry, IISc, Bangalore Organic Synthesis: Excitement, Challenges and Introspection
3. Dr. Akhila K. Sahoo, Department of Chemistry, Kyoto University, Japan Palladium-Catalyzed Novel Transformations  
Hiyama Cross-Coupling  
Reactions of Silicon Based Reagents and  
New Reactions on Porphyrin Periphery
4. Professor Santanu Bhattacharya, Department of Organic Chemistry, IISc, Bangalore Can We Control the Flow Behavior of a Gel?
5. Dr. Dipak K. Palit, Scientific Officer (H), Head, Radiation & Ultrafast Chemistry Section, Radiation & Photochemistry Division, Bhabha Atomic Research Centre, Mumbai Ultrafast Dynamics of Electron Transfer and Hydrogen-Bond



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|-----|--|---|
| 6.  | Prof. Miguel Yus, Department of Organic Chemistry, University of Alicante, Spain   | New methodologies based on an arene-catalyzed lithiation  |
| 7.  | Prof. Carmen Nájera, Department of Organic Chemistry, University of Alicante, Spain  | Oxime palladacycles: Stone-stable nonetheless very active Catalysts   |
| 8.  | Dr. Basudeb Saha, Department of Chemistry, Iowa State University, USA  | Cost-effective catalysts for the industrial production of Terephthalic acid   |
| 9.  | Prof. Amalendu Chandra, Department of Chemistry, IIT, Kanpur   | Hydrogen bonds and vibrational spectra of clusters, fluids and interfaces   |
| 10. | Professor Paul Alewood, Chair of Chemical and Structural Biology, Institute for Molecular Bioscience, The University of Queensland, Brisbane, Australia        | Drugs from Venoms   |
| 11. | Dr. Uday Mukhopadhyay, Department of Experimental Diagnostic Imaging, University of Texas MD Anderson Cancer Center, Houston, Texas, USA                       | Radiosynthesis of a novel substrate for PET imaging of histone deacetylase (HDAC)   |
| 12. | Prof. Jean-Luc Decout, Department of Molecular Pharmacology, Université Joseph Fourier-Grenoble I, Meylan, France  | Antiproliferative and/or antiviral thionucleosides  |
| 13. | Prof. Amitabha Sarkar, Organic Chemistry Department, Indian Association for the Cultivation of Science   | Ligands in Catalysis  |
| 14. | Professor Hans-Joachim Knölker, Technische Universität Dresden, Dresden, Germany   | Organometallic Synthesis and Pharmacological Activity of Carbazoles   |
| 15. | Prof. V. K. Singh, Department of Chemistry, IIT, Bombay  | Molecular Complexity from Aromatics   |
| 16. | Prof. S. Bhattacharjee, Department of Organic Chemistry, IISc. Bangalore   | Sequence and Structural Selectivity of Nucleic Acid Binding Ligands in Putative Drug Design                                     |
| 17. | Dr. Santanu Sengupta, Department of Chemical Physics, The Weizmann Institute of Science, Israel  | A semiclassical forward-backward hybrid initial value representation method and its application to a surface scattering problem |
| 18. | Professor (Ms) H. Ila, FASc, FNA, exProfessor, IIT Kanpur<br>Presently Principal Advisor Chemistry, Jubilant Discovery Center, Jubilant Biosys Ltd., Bangalore | New Cationic and Anionic Domino reactions for Efficient Construction of Carbocyclic and Heterocyclic Frameworks                 |

#### INVITED LECTURES BY FACULTY MEMBERS

- |    |                          |   |
|----|--------------------------|---|
| 1. | Dr. Sanjoy Bandyopadhyay | Dynamics of water around biomolecules: Computer simulation studies at Bhabha Atomic Research Center (BARC), Mumbai, India (October 12-14)                   |
| 2. | Dr. Sanjoy Bandyopadhyay | Dynamics of protein unfolding and the role of water at Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India (February 15-17) |

3. Dr. Sanjoy Bandyopadhyay Dynamics of water around biomolecules: Computer simulation studies (Part I: Hydration dynamics of pr at The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy (April 18)
4. Dr. Sanjoy Bandyopadhyay Dynamics of water around biomolecules: Computer simulation studies (Part II: Protein folding and wat at The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy (April 19)
5. Dr. Kumar Biradha Invited Lecture : Singapore International Chemical Conference, Singapore (Invited Speaker)
6. Dr. Kumar Biradha Invited Lecture : National Symposium on Chemistry : At The Inorganic and Organic Interphase, IIT, Guwahati (Invited speaker)
7. Dr. Kumar Biradha Invited Lecture : Discussion meeting on Intermolecular Interactions, Orange County, Karnataka (Invited Speaker)
8. Dr. Kumar Biradha Designing Metal-Organic Hybrid networks containing b-sheet hydrogen bonds and guest inclusion at Singapore (December, 8-10)
9. Dr. Kumar Biradha Designing Metal-Organic Hybrid Solids at IIT, Guwahati (December, 6-7)
10. Dr. Kumar Biradha Assembling Molecules via Non-covalent Interactions at Orange County, Coorg, Karnataka (November 30 – December 3)
11. Dr. J. Dey Chiral Nematic Liquid-Crystalline Phases of Mixtures of L-Amino Acid-Derived Zwitterionic Surfactants with Sodium Dodecyl Sulfate in Water, Ninth National Symposium in Chemistry, Delhi University, New Delhi, CRSI (2007)
12. Dr. J Dey Characterization of Microdomain Formation of Hydrophobically Modified Poly(Sodium N-Acryloyl-L-valinate) in Water by Fluorescence, Light Scattering, and Microscopic Techniques., National Symposium on Emerging Trends in Polymer Science and Technology, IIT, Kharagpur, 35, Society for Polymer Science (Kharagpur) (2006)
13. Dr. S. Hajra Asymmetric aldol reactions under normal and inverse addition modes of reagents at National Organic Symposium Trust (NOST), Goa 2007 (July 07-July 10)
14. Dr. S. Hajra Never Ending Journey on Asymmetric 1,2-Halo-functionalizations and Aldol Reactions: Synthesis of Bio at CRSI 2<sup>nd</sup> Mid Year Symposium, IIT Guwahati (July 21)
15. Dr. A. (Pathak) Mahanty Synthesis and characterization of nanosized yellow coloured rutile and priderite structured titanate pigment, Indo-Singapore Symposium on advanced Functional Materials (AFMS-06), IIT Mumbai (2006)
16. Dr. A. (Pathak) Mahanty Nanosized Pt-doped FeNbO<sub>4</sub> : A selective sensor to LPG at low temperature, Sensors and Actuators: Emerging Technological Challenges” (NCSA-06), CGCRI, Kolkata (2006)

17. Dr. A. (Pathak) Mahanty Preparation of inorganic fullerene – type MoS<sub>2</sub> nanospheres through solution method, Eighth International Conference on Nanostructured Materials (NANO-2006), IISc., Bangalore, (2006)
18. Prof. D. R. Mal International Symposium on Current Perspectives in Organic Chemistry, December 7–9, 2006, Indian Association for the Cultivation of Science, Kolkata (Participant)
19. Dr. A. Nag International conference : International conference on Biofuel , September 13-15, 2006, Bikaner, Rajasthan (Invited Lecture)
20. Dr. A. Nag Paper Presented : International Conference on Environmental Protection, Texas, USA (Attended seminar as paper is accepted)
21. Dr. C. Retna Raj Electrochemical biosensors based on nanostructured materials at Shimla (March 10, 2007)
22. Prof. J. K. Ray Chemoselective Functional Group Transformations at University of Melbourne, Melbourne, Australia (1 hour)
23. Prof. J. K. Ray Bifunctional Motifs in Organic synthesis at University of Queensland, Brisbane, Australia (1-hour)
24. Prof. T. K. Sarkar Synthesis and pharmacological evaluation of conformationally restricted nicotines at Nicholas Piramal Ltd., Mumbai
25. Prof. P. K. Chattaraj 'Conceptual Density Functional Theory', Invited Lecture : First Indo-US Lecture Series on Discrete Mathematical Chemistry, PESIT, Bangalore, January 2007
26. Prof. P. K. Chattaraj 'Conceptual DFT and Chem. Reactivity', Invited Lecture : Theoretical Chemistry Symposium, Bharathidasan University, Tiruchirapalli, December 2006
27. Prof. P. K. Chattaraj 'Quant. Pot. Based Tech. In Comp. Chem.', Invited Lecture : National Symposium on Computational Chemistry, Thiruvananthapuram in 2006
28. Prof. P. K. Chattaraj Organised : One Day Symposium in Theoretical Chemistry, IIT Kharagpur, March 2007 (Organiser)
29. Prof. P. K. Chattaraj 'QTM : Possible Future of Quant. Model.?', Invited Lecture : DAE-BRNS Theme Meeting on Materials Modelling at Different Length Scales, Bhaba Atomic Research Centre, Mumbai, October 2006
30. Prof. P. K. Chattaraj Attended: Midyear Meeting of Indian Academy of Sciences, Bangalore, July 2007 (Editorial Board Meeting, J. Chem. Sci.)
31. Prof. P. K. Chattaraj Invited Lecture : SERC School on Nonlinear Dynamics, IACS (Kolkata) December 2006 (Invited Lecture)
32. Prof. P. K. Chattaraj Invited Lecture : SERC School on Nonlinear Dynamics, IIT Kharagpur, December 2006 (Invited Lecture)

**THESES : DOCTORAL AND MS**

#	Name of Scholar	Title of Thesis
1.	Arijit Roy	Identification of Paths in Enzymatic Proton Transfer
2.	T.G. Abi	Quantum mechanics-Molecular Mechanics studies of Biological Proton Transfer Reactions
3.	Sk. Anwarul Haque	Bimetallic Reagents of Silicon: Preparation and Applications in the Synthesis of Biologically Significant Heterocyclic Ring Systems
4.	Manindra Nath Bera	Studies on Mono-, Di-, and Tetranuclear Complexes of 3D Transition Elements: Synthetic and Bioinorganic Model Aspects
5.	Krishnamoorthi S	Investigation on Anionic and Nonionic Flocculants Based on Dextran
6.	Ashok Kumar Mohanty	Vesicle-forming Single-tailed L-Amino Acid-derived Surfactants as Chiral Selectors for Enantiomeric Separations by Capillary Electrophoresis
7.	Asit Patra	Synthetic Studies of Chartresins, Chrymutasins, Gilvocarcins and Isoprekinamycin
8.	Jaya Prakash Das	Modified Hunsdiecker Reactions: Halo-, Nitro-, and Seleno-Decarboxylation of Aromatic – Unsaturated Carboxylic Acids
9.	Niranjan Panda	Generation and Trapping of Pyridine-Quinodimethanes and their Functional Analogues: Synthesis of Heterolignans and Conformationally Restricted Analogues of Nicotine
10.	Satyajit Dey	Total Synthesis of BE – 23254, a Chlorine Containing Angucycline Antibiotic and Synthetic Studies of Chrymutasins
11.	Sandip Kumar Roy	Design, Synthesis and Reactivity of Macrocyclic and Strained Bicyclic Eneynes with Novel Triggering Devices
12.	Chandi Charan Mandal	Isolation and Engineering of a Cry2A Insecticidal Crystal Protein of Bacillus Thuringiensis for Development in Transgenic Research for Control of Lepidopteran Insect Pests
13.	Pranab Halder	Studies on N-aryl - lactams: Selective Functional Group Transformations and Development of Synthetic Routes to N-aryl-formylpyrroles and Pyrroloquinoline Derivatives
14.	Sulangna Brahma	Design and Synthesis of some Heteroatom Containing Supramolecules: Selective Recognition of Dicarboxylic Acids, Complexation with Metal Ions and Preparation of some Spiro and Macrocyclic Compounds
15.	Sujit Kumar Ghosh	Optical, Electronic and Catalytic Aspects of Metal Nanoparticles
16.	Subrata Kundu	Synthesis and Application of Metal Nanoparticles in Analytical
17.	Paromita Debroy	Synthesis of Ferrocenes with Ene-Backbone and Development of a Multiresponsive Receptor for - Amino Acids
18.	Moloy Banerjee	Synchronizing the Reactivity of Tin (II) and Catalytic Transition Metal Partners: Carbon-Carbon Bond Formation via in-situ Generated Allenyl, Propargyl and Allyl Organometallics

19. Anjan Chakraborty Dynamics of Solvent Relaxation and Photoinduced Electron Transfer in Organized Assemblies and Room Temperature Ionic Liquids
20. Jnanojjal Chanda Molecular Dynamic Simulations of Surfactant Aggregates at Interfaces and the Effects of Ethanol on a model Phospholipid Membrane
21. Tapas Ranjan Kunor Theroretical Investigations on the Structure and Thermodynam9ics of Supercritical Fluids
22. Braja Narayan Patra Early Transition Metal Catalyzed Aqueous Polymerization
23. Joyanta Choudhury Designing Cooperative Catalysts within Ir-Sn Regime: Synthetic and Mechanistic Studies Towards Aromatic Alkylation
24. Ananta Karmakar Studies on Asymmetric Halohydrin and Aldol Reactions: Enantioselective Synthesis of Chloramphenicol, Thiamphenicol and Paraconic Acids
25. Kumar Sidhartha Lesav Varadwaj Synthesis and Studies on Some Diol Capped Nanocrystalline
26. Dibyendu Khatua Novel Anionic and Cationic Chiral Surfactants and Surfactant Mixtures: Self-Organization Studies and Applications in Enantiomeric Separations by Capillary Electrophoresis
27. Prasant Kumar Nanda Studies on the Coordination Chemistry of 3D Transition Elements with Multidentate Ligands; Mono-, Du- and Tetranuclear Complexes
28. Madhushree Sarkar Crystal Engineering of Metal-Organic Frameworks Containing Amide Functionalities : Some Studies on Networkds Recognitions, Transformation and Exchange Dynamics of Guests and Anions
29. Poulomi Roy Development and Characterization of some Important Nanodimensional Semiconducting Metal Chalcogenides
30. Bidyut Kumar Senapati Anionic [4+2] Cycloaddition in the Synthesis of Carbazoles and Synthetic Studies towards Furanosteroids
31. Sudipa Panigrahi Size and Shape Controlled Synthesis of Metal Nanoparticles and its Application in Catalysis and Surface Enhanced Raman Scattering
32. Bishnupada Dutta Synthetic Studies Toward Polycyclic Aza Arenes and Indoloquinoline Alkaloids
33. Indrajit Das Synthesis and Synthetic Applications of Endocyclic and Exocyclic Vinyl Sulfone-Modified Furanosides
34. A. Anand A Density Functional Theory Study of the Environmental Effects on Proton Affinity of Histidine and Other Molecules
35. A. Banerjee Synthesis and characterization of Nanocrystalline Rare Earth Based Phosphors with Tunable Morphologies
36. Arup Garu Transition Metal (Ni and Pd) Catalyzed Cross-Coupling Reacctions of Aryl Halides with Aniline and Amino Acids
37. Sumit Saha Transition metal catalyzed activation of aryl halides and their cross coupling reaction with diphenylamine
38. Adroha Bhattacharya Towards the Chemosynthesis of Conduritol Analogues

39. A. Bhattacharya Local Density Inhomogeneities In Supercritical Water: A Molecular Dynamics Simulation Study
40. A. Chakravarty Synthesis, Characterization and Properties of Ethylene Vinylacetate Copolymer/Layered Double Hydroxides Nanocomposites
41. A. Garu Transition Metal (Ni and Pd) Catalyzed Cross Coupling Reactions of Aryl Halides with Aniline and Amino Acids
42. A. Kumar Synthesis and characterization of Ferroelectric Lithium Niobates
43. A. Rit Studies on Fac-Trioxo Molybdenum Metalloligand and its Lithium Complex
44. Srivarmakrishna Transition Metal Complex Induced Aggregation of Au Nanoparticles
45. B. Bharath Studies on position specific propensities of amino acids in  $\alpha$ -helices
46. C Kumar Dynamics of solvent relaxation in room temperature Ionic liquid
47. D. Dey Synthesis and Reactions of Acyclic Vinyl Sulfone-Modified Carbohydrates
48. D. Ghosh Comparative study on the structure of solubilized methanol in reverse micelles using FT-IR spectroscopy
49. D. Jana Studies on Interaction of Copper Complexes of two major green tea polyphenols with ct-DNA
50. H. Shekhar A computer simulation study of the properties of (1:1) methanol/water mixture
51. J. Manna Preparation of Mesoporous Zirconium Phosphate and Zirconium Phosphate-Silica Composite and Study of their Catalytic Activity towards Esterification Reactions
52. Monty Biswas Reactivity of Amines towards different haloaldehydes and its conversion to Quinoline derivatives
53. M. Santra Chemical Synthesis and Characterization of Nano-Crystalline  $\text{Pr}^{0.1}\text{Zr}^{0.9}\text{O}_2$  &  $\text{Pr}^{0.1}\text{Zr}^{0.9}\text{SiO}_4$ , Yellow Ceramic Pigments
54. N. C. Giri New  $[(\text{Tmp})\text{M}_2\text{L}]$  complexes of 3d metal ions incorporating acetate and phenolate templates ( $\text{Tmp}^-$ ) and bimetal capping ligands
55. N. Dutta Studies on the synthesis of  $\gamma$ -thio lactams from  $\gamma$ -factams and the subsequent reduction of both to pyrrolidine derivatives
56. N. Pal An Atom Counting Strategy Towards Analyzing the Biological Activity of Sex Hormones and Solution of the Thomas-Fermi-Dirac-Weizsacker Equation
57. P. Dutta 3'-O-Carboxy esters of Thymidine: modification from phosphate to carboxylate enhances the inhibition of Ribonuclese A
58. P Jana Bimetallic Activation

59. P. Ravinder Effect of Hydrogen Bonding on Self-assembly Formation
60. P. Sanphui Synthesis of tetraamides from EDTA & substituted aromatic primary amines
61. Rama Saha Synthesis and Characterization of Nano Crystalline Ferroelectric  $Ba_{(1-3x)}La_{2x}Ti_{(1-3x)}Mn_{4x}O_3$  Ceramics
62. Rajeev Ranjan Singh Computer Simulation Studies of Hydrated DNA Solution
63. S. Ghanty Formal Synthesis of (+)-Canadensolide
64. Sunil Kumar Studies on the Spectral and Electrochemical Properties of Redox Molecules Immobilized on Au Nanoparticle
65. S Das Utilization of Three Non-edible Oils for the Production of Biodiesel Catalised by Enzyme
66. S. Duley Bismuth Luminescence of Nanosized Phosphore Materials
67. S. Gupta Synthesis of bioactive 3-alkyl substituted isobenzofuranones
68. S Mukherjee A Study on Electrophilicity, Hydrophobicity and Number of Nonhydrogenic Atoms as Potent Parameters for Prediction of Toxicity
69. Soumyakanta Pattnaik Cardanol Grafted Polybutadiene Rubber: Synthesis and Characterization
70. S. K.Pore Synthetic Studies of Anti Diabetes Polyphenolic Compounds
71. S. Ranjit Towards the Synthesis of Novel  $\gamma$ -Lactam Derivatives: Failures and Successes
72. S. Saha Transition Metal Catalyzed Activation of Aryl Halides and their Cross-Coupling Reaction with Diphenylamine
73. S. Singha Syntheses Of N, N'-Bis(3-Pyridyl) Alkanediamides And Studies Of Amide-To-Amide Hydrogen Bonding In Their Crystal Structures
74. S K Suman Synthesis and Characterization of Molybdenum Disulfide ( $MoS_2$ ) Nanoparticles
75. S Shekhar Synthesis of Nanoparticles of Metallic Copper in Aqueous Medium
76. S. Mondal Reactivity of Amines Towards Different Halovinylaldehydes and its Conversion to Quinoline Derivatives and Polyazaarenes
77. S Pal Preparation and characterization of pure and doped thin film of CdS by Chemical bath deposition
78. S Panda Towards the Total Synthesis of Dihydro Clavaminc Acid by Carbene Insertion
79. T. K. Saha Reversible Formation of Methylene Blue (Clock Reaction) by  $Cu_2O$  Nanoparticles
80. Vishal Theoretical Prediction of Probable Hydration Sites Inside Proteins

## BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	Dr. S. Bandyopadhyay	Water dynamics at the surface of proteins and micelles: Understanding the fast and the slow components	Taylor and Francis	2006
2.	Dr. A. Nag, Prof. K. B. De and Prof. G. L. Datta	Moulding Materials and Pollution	New Age Publishers	2006
3.	Dr. A. Nag	Analytical Techniques in Agriculture, Biotechnology and Environmental Engineering	Prienticel	2006

## LAURELS & DISTINCTIONS

1.	Prof. Debashis Ray	Bronze Medal of Chemical Research Society of India (CRSI), 2008
2.	Dr. S. Bandyopadhyay	Visiting Scientist, S. N. Bose National Centre for Basic Sciences, Kolkata, India, 2006
3.	Dr. S. Bandyopadhyay	Invited to chair a session at the Indo-EU thematic workshop on Computational Materials Science held at Indian Institute of Science, Bangalore, India, 2006
4.	Dr. S. Bandyopadhyay	Associate Member, Center for Computational Materials Science, JNCASR, Bangalore, India, 2006
5.	Dr. K. Biradha	Scopus young scientist award in chemistry by Elsevier, 2006
6.	Prof. T. Pal	CRSI Bronze Medal, 2007
7.	Prof. S. K. Srivastava	DAAD Fellow, 2006
8.	Dr. S. Taraphder	Regular Associate, International Centre for Theoretical Physics, Trieste, Italy, 2006
9.	Prof. P. K. Chattaraj	Member, Editorial Board, J. Chem. Sci. (Proc. Chem. Sci., Ind. Acad. Sci., Bangalore)
10.	Prof. P. K. Chattaraj	Member, Editorial Board, J. Assam Sci. Soc.
11.	Prof. P. K. Chattaraj	Member, Editorial Board, Canad. J. Pure & Appl. Sci., Canada, 2007
12.	Prof. P. K. Chattaraj	Invited talk in 'First Indo-US Lectur: First Indo-US Lec. Series on Discrete Math. Chem.' & Member: Int. Adv. Comm. At PESIT, Bangalore, January 2007, 2007.
13.	Prof. P. K. Chattaraj	Invited to deliver a talk in 'Theoretical Chemistry Symposium' & Member: NOC, Bharathidasan Univ., Tiruchirapalli, December 2006, 2006
14.	Prof. P. K. Chattaraj	Invited to deliver a talk in 'National Symposium on Computational Chemistry', & Member: NOC, Thiruvananthapuram, December 2006, 2006
15.	Prof. P. K. Chattaraj	Invited to deliver a talk in 'DAE-BRNS Theme Meeting on Materials Modelling at Different Length Scales', BARC, October 2006, 2006



16. Prof. P. K. Chattaraj Reviewer: J. Am. Chem. Soc., J. Phys. Chem., J. Org. Chem., Chem. Phys. Lett., Int. J. Quantum Chem., Langmuir, J. Chem. Phys., 2007
17. Prof. P. K. Chattaraj Bioorg. Med. Chem., J. Astrop. Astron., Tetrahedron, Chem. Res. Tox., Org. Lett., Int. J. Bif. and Chaos, Int. J. Mol. Sci., Int. Elect. J. Mol. Des., 2007
18. Prof. P. K. Chattaraj Pramana-J. Phys., Proc. Ind. Acad. Sci. (Chem. Sci.), Proc. Natl. Acad. Sci., Natl. Acad. Sci. Lett., Ind. J. Chem., Ind. J. Phys., 2007
19. Prof. P. K. Chattaraj Bioorg. Med. Chem. Lett., Chirality, QSAR & Comb. Sci., Pak. J. Sci. Ind. Res., J. Chem. Educ., Ind. Eng. Chem. Res., Nucl. Ac. Res., 2007
20. Prof. P. K. Chattaraj J.Comp. Chem., J.Chem. Theor. Comp , New J. Chem., J. Polym Sc. Tech., J. Mol. Liq. etc., 2007
21. Prof. P. K. Chattaraj 'Bioorg. Med. Chem. 2005, 13, 3405' has been recognised in the 'Top-50 most cited articles' as published in Bioorganic & Medicinal Chemistry 2004-2007, 2007
22. Prof. P. K. Chattaraj Several papers, e.g. Chem. Rev. 2006, 106, 2065, J. Phys. Chem. A 2006, 110, 6540 etc. have been considered as the most accessed articles, 2006

## 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 Engineering
Das Gupta, Shambhu Pada	Ph.D. (IIT Kanpur), Geotechnical Engineering
Dey, Subhasish	Ph.D. (IIT Kharagpur), Hydraulic & Water Resources Engineering
Ghosh, Deba Prasad	Ph.D. (IIT Kharagpur), Geotechnical Engineering
Mazumdar, Mayajit	Ph.D. (IIT Kharagpur), Transportation Engineering
Ramachandra, Lingadahally	Ph.D. (IIT Madras), Structural Engineering
Reddy, Kusum 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), Structural Engineering
Desai, Venkappayya R	Ph.D. (Clemson University), Hydraulic & Water Resources Engineering
Dhang, Nirjhar	Ph.D. (IIT Kharagpur), Structural Engineering
Ghangrekar, Makarand Madhao	Ph.D. (IIT Bombay), Environmental Engineering
Gupta, Ashok Kumar	Ph.D. (IIT Bombay), Environmental Engineering
Maitra, Bhargab	Ph.D. (IIT Bombay), Transportation Engineering
Maity, Damodar	Ph.D. (IIT Kharagpur), Structural Engineering
Sen, Dhruvajyoti	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), Environmental Engineering
Roy, Debasis	Ph.D. (University of British Columbia), Geotechnical Engineering

Sen Gupta, Aniruddha                      Ph.D. (Illinois University), Geotechnical Engineering  
Reddy, M. Amaranatha                      Ph.D. (IIT Kharagpur), Transportation Engineering

**Sr. Lecturer :**

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

**Visiting Faculty :**

Majumdar, Swapan                              Ph.D. (University of Wisconsin), Structural Engineering

**Emeritus Professor :**

Pandey, B. B.                                      Ph.D. (IIT Kharagpur), Transportation Engineering

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

**Faculty Appointment :**

Dr. D. Maity                                      Associate Professor  
Dr. S. Chakraborty                              Assistant Professor  
Dr. A. Pal    Assistant Professor  
Dr. S. J. Hussain                                  Sr. Lecturer  
Dr. P. Ghosh                                        Sr. Lecturer  
Dr. S. Verma                                        Sr. Lecturer

**Faculty Appointed as Emeritus Professor :**

Prof. B. B. Pandey                              Emeritus Professor

**Faculty Promotion :**

Prof. S. Dey                                        Professor  
Prof. L. S. Ramachandra                      Professor  
Dr. B. Bhattacharyya                          Associate Professor  
Dr. M. M. Ghangrekar                          Associate Professor  
Dr. A. K. Gupta                                  Associate Professor  
Dr. B. Maitra                                        Associate Professor

**Faculty Retirement :**

Prof. Mayajit Mazumdar                      Professor

**Faculty Resignation :**

Dr. P. Ghosh

Sr. Lecturer

**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 TiO<sub>2</sub>.
2. STE : Recycled construction materials, Stability of plates and shells, Biomechanics, Reliability of bridge structures.
3. TE : Cell filled low cost rural roads, Analysis and Evaluation of Concrete and flexible pavements, Specifications for bituminous mixes and Urban transportation planning.
4. 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.
5. 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, Bio-energy.
2. STE : Reliability Engineering, Nonlinear Mechanics, Structural Health Monitoring, Fluid-Structure Interaction.
3. HWRE : Submerged Jets, Coherent Turbulent Structure, Sediment Transport and Scour, Numerical Study of Surface Flow, Hydrological Model.
4. TE : Pavement Design, Traffic Planning and Design, Low-cost Road Construction.
5. GTE : Geotechnical Earthquake Engineering, Rock Slope Stability, Ground Improvement with Natural additives and Foundation Strengthening of Monumental Structures.

**New Acquisitions :**

1. EnE : Microbiological hood, Vacuum filtration assembly, Digital Colony Counter, refrigerated centrifuge
2. STE : 600 kN Universal Testing Machine

**ON-GOING RESEARCH PROJECTS****Sponsored Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	A study on The Effects of Layering on The Dynamic Response of Foundations	CSIR	8.50 Lakhs

2.	Bridge scour estimation, measurement and protection and use of various time systems like TDR, TTS and SA	RDSO	151.00 Lakhs
3.	Buckling and Non-linear Postbuckling analysis of stiffened composite shells based on Wavelet-Galerkin Projection	Respond, ISRO, Bangalore	6.96 Lakhs
4.	Coupled sloshing Response in a stiffened composite container	ARDB	5.17 Lakhs
5.	Design of Stilling Basin under variable hydraulic conditions	Ministry of Water Resources, GOI	19.50 Lakhs
6.	Development of Advanced Facility for Testing Bituminous Mixes	MHRD	20.00 Lakhs
7.	Development of Low-cost Technology for Arsenic Removal and an Easy to Detect Method for Arsenic Analysis for the Rural Areas of West Bengal	Department of Science and Technology	5.60 Lakhs
8.	Evaluation of bituminous mixes using bituminous pavement analyzer	IIT Kharagpur	5.00 Lakhs
9.	Modeling & Monitoring of Landslide Hazard in Sikkim Himalayas	DST, GOI	23.00 Lakhs
10.	Modelling Generalized Cost of Travel and Studying the Sensitivity of its Components using SP and RP Data	DST, GOI	5.00 Lakhs
11.	Multi-scale modeling to study the role of atomic scale defects in CNT-based nanocomposites	DST, GOI	20.50 Lakhs
12.	Multiscale modeling of small scale interfacial phenomena in carbon nanotube reinforced composites	IIT Kharagpur	3.00 Lakhs
13.	National Programme of Earthquake Engineering Education	MHRD, GOI	64.25 Lakhs
14.	Recycled Aggregate based concrete	UGC	8.96 Lakhs
15.	Resource mapping / Flood analysis of Ajay and Mayurakshi rivers using RS/GIS	DST	15.00 Lakhs
16.	Rural roads pavement performance studies	NRRDA, Govt. of India	10.00 Lakhs
17.	Simulation studies of mechanical behaviour and failure of carbon nanotubes	DMRL, Hyderabad	10.00 Lakhs
18.	Status of Landslide Problem in Sikkim	DST, New Delhi	0.30 Lakhs
19.	Studies on Anaerobic-Aerobic Package Sewage Treatment Plants	UGC, New Delhi	5.00 Lakhs)
20.	Synthesis and characterization of mono and bimetallic nanoparticles on supported systems and their application for the degradation of organic pollutant	IIT Kharagpur	5.00Lakhs

21.	Theoretical & Experimental Investigation of Strain Localization in Cohesive Soils under Plane Strain Condition	DST, New Delhi	13.00 Lakhs
22.	Treatment and Reuse of Sewage from Small Community	IIT, Kharagpur	3.00 Lakhs
23.	Water Quality and Health Assessment	IIT Kharagpur	3.00 Lakhs

**Consultancy Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Advice on rehabilitation of cracked Bituminous Pavement of SH-5 in Gujarat	IRCON	3.00 Lakhs
2.	Analysis of Bund Stability of Existing Red Mud Ponds	Indian Aluminium Company, Ltd., Ranchi	0.55 Lakhs
3.	Checking of Design of siphon aqueduct over river Sagada at RD 2820m of Upper Indravati right main extension canal	Upper Indravati Irrigation Project, Govt. of Orissa	5.00 Lakhs
4.	Checking of Launching scheme for Railway over bridges on NH-41	CWHEC-HCIL (J.V)	3.50 Lakhs
5.	Checking of the design of lighting masts	B. P. Projects, Kolkata	1.50 Lakhs
6.	Checking of the Distressed water tank	Executive Engineer, P.H. Division-III, Bhubaneswar	1.01 Lakhs
7.	Collection & characterization of environmental quality for water, wastewater, air & soil	Various govt. and private agencies	1.12 Lakhs
8.	Construction of Girls' Hostel – Rani Laxmibai Hall of Residence	IIT Kharagpur	17.60 Lakhs
9.	Cyclone risk assessment for West Bengal coast	Department of Relief, Govt. of West Bengal	40.00 Lakhs
10.	Adoptability of surge analysis report for Stages I & II of Guthpa Lift Irrigation Scheme	Central Designs Organisation, Hyderabad	0.08 Lakhs
11.	Cyclone Shelter at Orissa coast	PMO	25.00 Lakhs
12.	Design of Bituminous Mix for Bhubaneswar Airport Runway	(M/s TRG Industries Pvt. Ltd.	0.50 Lakhs
13.	Design of UASB reactor for bio-diesel wastewater treatment	Industrial Water Engineers, Malaysia	4.00 Lakhs
14.	Development of guidelines for earthquake design of embankments and dams	Gujarat State Disaster Mitigation Authority	5.00 Lakhs
15.	Development of Software for the analysis of steel-cord pipe conveyor belt	Phoenix-Yule Ltd.	2.20 Lakhs
16.	Drainage plan for Shantiniketan – Sriniketan	Shantiniketan – Sriniketan Development Authority	15.00 Lakhs

17.	Environmental Impact Assessment and Environmental Management Plan for the proposed Dwarakeswar Gandheswari Reservoir project (West Bengal)	Supdt. Engineer, Investigations & Planning Circle, No. II, I&W Dte., Kolkata	20.22 Lakhs
18.	Evaluation of binders and emulsions for the four laning work of NH-5A	M/s Hindustan Construction Co. Ltd.	0.60 Lakhs
19.	Evaluation of Crumb Rubber Modified Binder	IOCL, Bhubaneswar	0.25 Lakhs
20.	Evaluation of field samples of bituminous mix	Telcon Ecoroad Resurfaces Pvt. Ltd., Bangalore	0.35 Lakhs
21.	FS and DPR for 4/6 laning of NH-37 from Naugaon to Jorhat in the state of Assam	Wilbur Smith Associates, Bangalore	1.80 Lakhs
22.	Health Monitoring of a building Structure	West Bengal Housing Board, Kolkata	3.00 Lakhs
23.	Investigation of RE Wall Distress at Km 18 of NH-6 and Design of Remedial Measures	National Highway Authority of India	5.61 Lakhs
24.	Job Mix formula for BM and SDAC	Border Roads task Force, 99 APO	0.34 Lakhs
25.	Job Mix formula for dense bituminous _odifie	Intercontinental Consultants and Technocrats Pvt. Ltd., Silchar	0.35 Lakhs
26.	Job Mix formula for dense bituminous macadam	Intercontinental Consultants and Technocrats Pvt. Ltd., Silchar	0.35 Lakhs
27.	Monitoring of RE Wall reconstruction at km 18.2, NH6	NHAI	2.00 Lakhs
28.	National Programme on Technology Enhanced Learning	MHRD	290.70 Lakhs
29.	Paschimanchal Perspective Plan for 2020	Paschimanchal Unnayan Parishad, Govt. of W.B.	10.00 Lakhs
30.	Pavement design and travel demand forecasting for 4/6 laning of NH-52A and NH-52 from Itanagar to Helem	Wilbur Smith Associates, Bangalore	2.00 Lakhs
31.	Planning of Public Transportation System in the City of Buraida, Saudi Arabia	Gulf Engineering House, Saudi Arabia	\$14825
32.	Preparation of Aizawl Master Plan	Aizawl Devl. Authority, Aizawl, Mizoram	70.22 Lakhs
33.	Preparation of City Development Plan for Burdwan Planning Area	Burdwan Devl. Authority, Burdwan	11.23 Lakhs
34.	Preparation of detailed project Report for periphery road	Bharatiya Note Mudran Ltd., Salboni	10.00 Lakhs
35.	Preparation of Master Plan of Drainage System in Planning Area of Sriniketan Santiniketan Development Authority	Executive Officer, SSDA Bholpur	15.00 Lakhs

36.	Preparation of Perspective Plan 2030 for Planning Areas under Asansol-Durgapur Development Authority and Burdwon Development Authority	Asansol-Durgapur Development Authority, Asansol	27.55 Lakhs
37.	Preparation of Perspective Plan – Vision 2030 and Comprehensive Development Plan areas of Bhubaneswar and Cuttack Development Authority	Housing and Urban Development Dept., Govt. of Orissa,	165.29 Lakhs
38.	Preparation of Socio-Economic Perspective Plan for the Development of Paschimanchal Unnayan Parshad Area	Member-Secretary Paschimanchal	11.02 Lakhs
39.	Proof checking of remedial measures in closing gaps in between the trestle abutments of bridge No. 85/1 of NH 5	Sheladia Associates Inc, Bhubaneswar	1.40 Lakhs
40.	Rain Water Harvesting for Tata Metaliks Limited Kharagpur Plants	Tata Metaliks Ltd., Kharagpur	3.35 Lakhs
41.	Rainwater Harvesting in BRBNMPL Campus, Salboni	Bharatiya Reserve Bank Note Mudran (P) Ltd., Salboni	5.00 Lakhs
42.	Review of alternative foundation proposal based on bored piles for bridge piers at ch.422/1 and 430/1 of NH-31	ITD Cementation India Ltd.	1.13 Lakhs
43.	Review of foundation proposal based on bored piles for bridges at Ch 422/1 and 430/1, NH34	ITD Cementation	1.10 Lakhs
44.	Scrutiny of Technical Proposals for Pradhan Mantri Gram Sadak Yojana work	NRRDA, Delhi	3.39 Lakhs
45.	Software capabilities for reliability analysis of ship structures	Indian Register of Shipping	4.00 Lakhs
46.	Soil Investigation and Geotechnical Design for Foundation of the proposed Bridge across the Old Kansabati near Daspur	Panchayat Samity, Daspur-I, Midnapore	0.75 Lakhs
47.	Soil Test of Microwave Compound at Mohanpur, Midnapore	BSNL, Tamluk	0.20 Lakhs
48.	Soil Tests for the M/S ICICI Bank	ICICI Winfra, Kolkata	0.33 Lakhs
49.	Study of water supply distribution/ storage and source availability for Darjeeling Municipality	District Magistrate, Darjeeling	4.82 Lakhs
50.	Study of water supply distribution/storage and source availability for Darjeeling Municipality	District Magistrate, Darjeeling	4.82 Lakhs
51.	Testing of _odified bitumen	K.K. Plastic Waste Management Pvt. Ltd., Bangalore	0.30 Lakhs
52.	Testing of PMB sample	504 SS & TC (GREF)	0.25 Lakhs



53.	Traffic Engineering for FS and DPR for 4/6 Laning of NH 37 from Nagaon to Jorhat in the State of Assam (Package No. NHDP-III/DL4/10)	Wilbur Smith Associates	0.90 Lakhs
54.	Traffic Studies for Development of Spencer Mall, Kolkata	SYSTRA Consulting India Pvt. Ltd.	2.00 Lakhs
55.	Traffic Study for Project- ITC East India, Kolkata	ITC Limited	2.70 Lakhs
56.	Traffic Study for the Proposed Mixed Use Township Complex in Kasba Area, Kolkata	Bengal-NRI	2.40 Lakhs
57.	Transportation Study for Increase in Traffic Level and Revenue via Vidyasagar Setu	HRBC, Govt. of West Bengal	7.00 Lakhs
58.	Vetting of design and drawing of railway crossing structure, Bhairwa reservoir scheme, Hazaribagh	Water Resources Department, Govt. of Jharkhand	4.00 Lakhs
59.	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 Bhar	Water Resources Department, Govt of Jharkhand	4.00 Lakhs
60.	Vikram Sarabhai Residential Complex	IIT Kharagpur	9.60 Lakhs

#### **VISITS ABROAD BY FACULTY MEMBER**

1.	Dr. Makarand Madha Ghangrekar	Attending conference for presentation of paper (AIT, Bangkok) September 25-27
2.	Dr. Makarand Madha Ghangrekar	Consultancy project work (Kualalampur, Malaysia) March 15-17
3.	Dr. Sudha Goel	Paper presentation in 'The International Conference on Interdisciplinary Social Sciences' (Rhodes, Greece) July 20, 2006
4.	Dr. Makarand Madha Ghangrekar	Attending Conference on Wastewater Biosolids Sustainability as Invited Delegate (Moncton, Canada) June 24-28, 2007
5.	Prof. Subhasish Dey	Royal Society Short Visiting Fellowship (University of Bradford, UK) 10 weeks
6.	Prof. Subhasish Dey	Offered a Short Course "Sediment Transport and Scour" (University of Pisa, Italy) 5 days
7.	Prof. Subhasish Dey	Offered a Short Course "Sediment Transport and Scour" (University of Calabria, Italy) 5 days
8.	Prof. Subhasish Dey	India-Australia Workshop on Water Resources Engineering (University of Adelaide, Australia) 5 days
9.	Prof. Subhasish Dey	Obermann Interdisciplinary Research Grant (University of Iowa, USA) 4 weeks
10.	Dr. Ashok Kumar Gupta	Delivered invited lecture and collaborative research in the area of air quality (Texas A& M University Kingsville, Texas (USA) September 29 to October 7

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|-----|----------------------------------|---|
| 11. | Dr. Ashok Kumar Gupta            | Collaborative research in the area of air quality (Texas A & M University, Kingsville, Texas, USA) June 7 to July 6                   |
| 12. | Dr. Aniruddha Sen Gupta          | International Conference on Advances in Earth Structures (ASCE) (Shanghai, China)   |
| 13. | Dr. Sudhir Kumar Barai           | Presented papers during EASEC-10 and delivered lectures at various colleges in Thailand (Bangkok, Thailand) 1 week                    |
| 14. | Dr. Dhruvajyoti Sen              | Commonwealth Academic Fellowship (University of Bristol, UK) January 10 to July 6, 2007   |
| 15. | Dr. Debasis Roy                  | Attended 59th Canadian Geotechnical Conference (Vancouver, BC, Canada) One week   |
| 16. | Dr. Anjali Pal                   | Delivered an Invited talk (The University of Catania (Italy), December  |
| 17. | Dr. Anjali Pal                   | Delivered an Invited talk (National Nanotechnology Laboratory of CNR-INFM (Italy), December   |
| 18. | Dr. Bhargab Maitra               | External Examiner for the Academic Year 2006-2007 (University of Dar Es Salaam, TANZANIA) June 06 to July 06, 2007                    |
| 19. | Dr. Venkappayya R Desai          | Participated and presented a paper in 'Environmental Science and Technology (EST)-2006' Conference (Houston, Texas, USA) August 18-24 |
| 20. | Prof. Sriman Kumar Bhattacharyya | To Exchange research and academic activities (Braunschweig, GERMANY) Two months during May - July 2007                                |
| 21. | Dr. Baidurya Bhattacharya        | Attended the 16th International Ships and Offshore Structures Congress (Southampton, UK) 4 days                                       |
| 22. | Dr. Baidurya Bhattacharya        | Organized the Bruce Ellingwood Symposium (Baltimore, MD, USA) 1 day   |

#### 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 and Fulbright Research Scholar 2004, Visiting Faculty, Indian Institute of Technology Bombay, India) | Asset Management Strategies to Optimize Transportation Investment      |
| 2. | Prof. Sukalyan Sengupta (Department of Civil and Environmental Engineering, University of Massachusetts, Dartmouth, MA, USA)  | Ion-Exchange Fibers: Synthesis, characterization and novel application |
| 3. | Prof. John Kuruvilla (Frank H. Dotterweich College of Engineering, Texas A&M University, Kingsville, Texas, USA)  | Urban and Regional Air Quality Affecting South Texas                   |

4. Prof. B. Mutlu Sumer (Coastal and River Influence of turbulence on bed-load  
Engineering Section, Department of transport  
Mechanical Engineering, Technical  
University of Denmark)
5. Jøgen Fredsøe (Coastal and River Coastal sediment transport  
Engineering Section, Department of  
Mechanical Engineering, Technical  
University of Denmark)

#### INVITED LECTURES BY FACULTY MEMBERS

1. Dr. Makarand Madha Ghangrekar Design of UASB reactor (Indian Water Works Association, Nagpur Centre)
2. Dr. M Amaranatha Reddy Pavement Material characterization; Flexible pavement Design for ruralroads; Geometric design of rura (Road Research Laboratory, Guwahati)
3. Dr. M Amaranatha Reddy Flexible and rigid pavemeny design for rural roads (College of Engineering, Bhubaneswar)
4. Prof. Subhasish Dey Sediment Threshold (University of Glasgow, UK)
5. Dr. Dilip Kumar Baidya Earthquake and Liquefaction of soils (Jadavpur University, Kolkata)
6. Dr. Dilip Kumar Baidya Design of Earthquake resistant shalow foundation, Liquefafaction of soils (Lucknow)
7. Dr. Ashok Kumar Gupta Measurement of Atmospheric Aerosols in an Urban Region,India and the Assessment Pulmonary Deposition (Texas A&M University, Kingsville, Texas, USA)
8. Dr. Ashok Kumar Gupta Fluoride in Drinking Water: A Global Perspective by Gupta, Ashok Kumar (Annamalainagar, Chidambaram)
9. Dr. Ashok Kumar Gupta Fluoride As A Geo-Indicator and Its Pathways (MNNIT, Allahabad)
10. Dr. Ashok Kumar Gupta Urban Water supply and sanitation (MNNIT, Allahabad)
11. Dr. Ashok Kumar Gupta Fluoride As A Geo-Indicator and Its Pathways (IIT Kharagpur)
12. Dr. Ashok Kumar Gupta An Application of Artificial Neural Networks to the Prediction of Air Pollution Concentrations (IIT Kharagpur)
13. Dr. Ashok Kumar Gupta Fluoride and Arsenic in Drinking Water (IRIIM Bhawan, Mourigram, Howrah)
14. Dr. Ashok Kumar Gupta Rural Drinking Water System and Sanitation : Role of NSS (IIT Kharagpur)
15. Dr. Aniruddha Sen Gupta Field Instrumentation, Performance Monitoring and Evaluation of Tailings Dam (National Institute of Technology, Rourkella)
16. Dr. Sudhir Kumar Barai Lateral Computing Approach for Civil Engineering Management Problems (Walailak University, Nakhon Si Thammarat, Thailand)
17. Dr. Sudhir Kumar Barai Lateral Computing Approach for Civil Engineering Management Problems (Chulalongkorn University, Bangkok, Thailand)

18. Dr. Sudhir Kumar Barai Vulnerability and Risk Assessment of Natural Disasters (UNDP Bhubaneswar)
19. Dr. Sudhir Kumar Barai Infrastructure Health Monitoring (SVNIT Surat)
20. Dr. Sudhir Kumar Barai Damage Assessment of Railway Steel Bridges: Fuzzy Logic Approach (SVNIT Surat)
21. Dr. Sudhir Kumar Barai Damage Assessment of Railway Steel Bridges: Fuzzy Logic Approach (MSU, Baroda)
22. Dr. Sudhir Kumar Barai Environment Conscious Construction Practice for Sustainable Development (Sthapatya 2007, Surat)
23. Dr. Sudhir Kumar Barai Neuro Models for Structural Engineering Applications (Sthapatya @ 2007)
24. Dr. Sudhir Kumar Barai Knowledge Discovery and Data Mining (SVNIT Surat)
25. Dr. Sudhir Kumar Barai Neural Networks Applications in Structural Reliability Problems: An Overview (IIT Kharagpur)
26. Dr. Sudhir Kumar Barai Knowledge Discovery and Data Mining Application in Environmental Engineering: An Overview (IIT Kharagpur)
27. Dr. Sudhir Kumar Barai Damage Assessment of Railway Steel Bridges: Fuzzy Logic Approach (IIT Kharagpur)
28. Dr. Sudhir Kumar Barai Artificial Neural Networks: An Introduction (IIT Kharagpur)
29. Dr. Sudhir Kumar Barai Neural Networks Applications in Structural Engineering (IIT Kharagpur)
30. Dr. Sudhir Kumar Barai Parallel Implementation of Neuro Models for Structural Engineering Problems (IIT Kharagpur)
31. Dr. Sudhir Kumar Barai Examples of Data Mining in Transportation Engineering (IIT Kharagpur)
32. Dr. Sudhir Kumar Barai Instance Based Learning Models for Liquefaction Potential Assessment (IIT Kharagpur)
33. Dr. Sudhir Kumar Barai Soft Computing Tools for Analysis of Tall Structural Systems (IIT Kharagpur)
34. Dr. Ashok Kumar Gupta Rural Drinking Water System and Sanitation: Role of NSS (IIT Kharagpur)
35. Dr. Ashok Kumar Gupta Rural Drinking Water System and Sanitation: Role of NSS (IIT Kharagpur)
36. Dr. Anjali Pal Detection of anionic surfactant and its removal from aquatic environment using low-cost adsorbent (Bhilai Nagar, Durg)
37. Dr. Bhargab Maitra Traffic Signs, Delineators and Road Markings (College of Engineering and Technology, Bhubneswar)
38. Dr. Bhargab Maitra A Spatial Quantitative Approach for EIA of Highway Projects (IIT Guwahati)
39. Dr. Bhargab Maitra Potential Rationalization of On-Street Parking on Urban Roads (IIT Guwahati)
40. Dr. Bhargab Maitra Willingness-To-Pay and Preference Heterogeneity for Rural Bus Attributes (IIT Guwahati)

41.	Dr. Shaikh Jahangir Hossain	Newmark-Scheme on Manifold of Finite Rotations and its Applications (IIT Madras)
42.	Prof. Sriman Kumar Bhattacharyya	Steel-concrete composite system (CET, Bhubaneswar)
43.	Dr. Baidurya Bhattacharya	Fracture and Fracture resistance of carbon nanotubes (IISc, Bangalore)
44.	Dr. Baidurya Bhattacharya	Tensile properties and fracture resistance of single-walled carbon nanotubes through atomistic simulation (DMRL, Hyderabad)
45.	Dr. Baidurya Bhattacharya	Analysis of Randomness in Mechanical Properties of Carbon Nanotubes through Atomistic Simulation (IGCAR, Kalpakkam)

#### THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	Dipanjana Maulik	Sequential Analytical Solution for Modelling Water Quality in Tidal Rivers
2.	Ashok Kumar Mishra	Drought Characterization and Forecasting-A Hybrid Approach
3.	Ms Kakoli Karar	Monitoring and characterization of ambient air quality in residential, commercial and industrial regions of an urban area
4.	Anirban Mandal	Experimental Investigation of Dynamic Response of Surface Foundation Resting on Layered soil System
5.	Soumendra Nath Kuiry	Development of Finite Volume Shallow Water Flow Models and Application to Floodplain Inundation
6.	Rajkumar V. Raikar	Characteristics of Flow over Gravel-Beds and Scour within Contractions
7.	Umesh Kumar Dewangan	Studies on Structural Damage Detection and Health Monitoring

#### BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	Prof. J. N. Bandyopadhyay	Design of Concrete Structures Manuscript	Prentice Hall of India Pvt. Ltd., New Delhi	2007

#### LAURELS & DISTINCTIONS

1.	Prof. Subhasish Dey	Obermann Interdisciplinary Research Grant, USA (2006)
2.	Prof. Subhasish Dey	Royal Society Short Visiting Fellowship (2007)
3.	Dr. Debasis Roy	Member - Bureau of Indian Standards, Committee 39(10) (2007)

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

1. Bruce Ellingwood Symposium
2. Advanced Technologies for Water and Wastewater Treatment      November 20-25, 2006  
(One Week)
3. Earthquake Effects on Tall Structures      November 12-16, 2006
4. Seismic Behaviour, Analysis & Design of Tall Structures      November 8-12, 2006
5. Seismic Reliability and Life Assessment of Structures      March 12-16, 2007
6. Soft Computing Tools in Civil Engineering      One week

## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

**HEAD : Professor Indranil Sengupta**

### **FACULTY**

#### **Professor :**

Basu, Anupam	Ph.D. (IIT Kharagpur), Speech and Language Processing, Embedded Systems, Emotional Intelligence, Assistive Technology
Chakrabarti, Partha Pratim	Ph.D. (IIT Kharagpur), Artificial Intelligence, CAD for VLSI, Algorithms, Formal Verification
Dasgupta, Pallab	Ph.D. (IIT Kharagpur), Formal Verification, VLSI Design Validation
Ghose, Sujoy	Ph.D. (IIT Kharagpur), Networks, Algorithms, AI, Info Systems
Kumar, Rajeev	Ph.D. (Sheffield), Programming Languages & Compilers, Software Engineering, 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), Low Power VLSI Design, Embedded Systems, Networking
Pal, Ajit	Ph.D. (Calcutta University), Low Power VLSI Design, Embedded Systems, Networking
Pal, Sudebkumar Prasant	Ph.D. (IISc Bangalore), Design and analysis of algorithms, Computational geometry
Roychowdhury, Dipanwita	Ph.D. (IIT Kharagpur), Cellular Automata, VLSI, Cryptography
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), Cryptography and Network Security, VLSI Design and Testing, Mobile Computing

#### **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), Peer-to-peer Networks, Complex Network Theory, Social Network Modelling
Mitra, Pabitra	Ph.D. (ISI Calcutta), Machine learning, Data mining, Artificial Intelligence

**Lecturer :**

Dey, Partha Sarathi	M.Tech. (IIT Kharagpur), Digital Logic Design, Data Structure, Computer Architecture & Organization, Microprocessor & Microcontroller, Systems Programming, Operating System, Object Oriented Design
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**FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION****Faculty Promotion :**

Prof. Sudeshna Sarkar	Professor
Prof. Rajeev Kumar	Professor
Prof. Pallab Dasgupta	Professor
Prof. Dipanwita Roychowdhury	Professor

**Faculty Retirement :**

Prof. S. C. DeSarkar	Professor
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**RESEARCH AND DEVELOPMENT****Brief descriptions of on-going activities :**

1. Design and Development of a microcontroller based portable ECG machine
2. Design and development of a sensor mote for monitoring the health of railway bridges
3. System for automatic evaluation of C programs
4. Web Based Course Management System
5. Chitra-Katha: A Voice output Communication Device with Auto Scan and PC Download

**Thrust Areas :**

1. Artificial Intelligence
2. Assistive Technology
3. Bioinformatics
4. Combinatorial and Computational Geometry
5. Computer Graphics
6. Computer Networks
7. Cryptography and Network Security



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

## ON-GOING RESEARCH PROJECTS

### Sponsored Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	A Multilingual Processing of Language in a Lexico-Semantic Perspective	STIC-Asia	0.00 Lakhs
2.	Advanced VLSI Consortium	Multiple Consortium	100.00 Lakhs
3.	An Integrated Framework for Testing	DST	10.00 Lakhs
4.	Automated Processing of Text Documents	MHRD	8.00 Lakhs
5.	Combinatorial and Geometric Approaches to Digital Imaging Applications	IIT Kharagpur	1.35 Lakhs
6.	Cross Language Information Access	MCIT	65.00 Lakhs
7.	Design and development of a signal processing system-on-chip	MHRD	6.00 Lakhs
8.	Design and implementation of a cryptosystem resistant to vulnerabilities and side channel attacks	Department of Information Technology, GOI	138.00 Lakhs
9.	Design of An Indigenous Encryption Algorithm for SDH-16	ITI, Bangalore	40.00 Lakhs
10.	Designing robust and self-organised p2p system over peer-to-peer networks	DST	20.00 Lakhs
11.	Developing robust and efficient services for open source Internet telephony over peer to peer network	DST-BMBF	3.92 Lakhs
12.	Developing robust services for peer to peer networks	IIT Kharagpur	3.00 Lakhs
13.	Development of Cross-Lingual Information Access (CLIA) system	MCIT	61.51 Lakhs
14.	Development of Custom Application Language	Usha Communications, Kolkata	2.00 Lakhs

15.	Development of Indian Language to Indian Language Machine Translation System (IL-IL MT)	MCIT	46.00 Lakhs
16.	Development of Multimedia Hardware-Software system for the Education of Students with Cerebral Palsy and Communication	Ministry of Social Justice and Empowerment GOI	17.00 Lakhs
17.	Efficient testing for system-on-chip design -- a new VLSI manufacturing paradigm	DST, Govt. of India	9.40 Lakhs
18.	Encompression - Encryption in Compressed Domain (Pre-project)	ISRO, Ahmedabad (STC, IIT Kharagpur)	2.00 Lakhs
19.	Extending the Frontiers of Design Validation using Formal Property Verification and Symbolic Simulation	DST, Govt. of India	19.29 Lakhs
20.	Games in System Design and Verification	DST, Govt. of India	8.40 Lakhs
21.	High Level Synthesis and Verification of Digital Circuits	MHRD	6.00 Lakhs
22.	High Speed End to End ASIC Design of Rijndael for AES Rijndael Cryptosystem	ISRO, Ahmedabad (STC, IIT Kharagpur)	13.50 Lakhs
23.	Indian Language Machine Translation	MCIT	45.00 Lakhs
24.	Investigation of Cryptanalytic Techniques	Ministry of Defence, GOI	44.30 Lakhs
25.	Low Power Circuits and Systems	Intel Corporation, USA	22.00 Lakhs
26.	Machine Learning for Cross Language Information Retrieval	IIT Kharagpur	3.00 Lakhs
27.	Modelling and Management of Dynamic Multimedia Objects	DST, Govt. of India	18.00 Lakhs
28.	Multimedia Modeling of Dynamic Objects	DST, Govt. of India	18.00 Lakhs
29.	Multiobjective Evolutionary Algorithms for Combinatorial Optimization Problems	MHRD, Govt. of India	10.00 Lakhs
30.	Natural Language (Indian) and voice enabled communication system for the physically challenged	MHRD	7.00 Lakhs
31.	Setting up Information and Communication Technology Enabled Laboratory at NIMH Hyderabad	National Institute for Mentally Handicapped, Hyderabad	5.00 Lakhs
32.	Shruti: A Vernacular Speech Recognition System	Media Lab Asia	25.00 Lakhs
33.	Special Manpower Development Programme for VLSI Design and Related Software (SMDP-II)	Ministry of Information Technology, Govt. of India	90.00 Lakhs

34.	Survivable System Architecture with Intrusion Tolerance, Containment and Recovery in Distributed Environment	Ministry of Information Technology, Govt. of India	55.00 Lakhs
35.	Verification of Digital Circuits	MHRD	6.00 Lakhs
36.	VLSI and Wireless Technologies	IIT Kharagpur	5.00 Lakhs
37.	Web Enabled Medical Information Access Using Handheld Devices in a Wireless Environment for Telemedicine Applications	Ministry of Information and Communication Technology, Govt. of India	62.10 Lakhs

**Consultancy Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Sanyog: A Communication System for the Speech Impaired and Children with Cerebral Palsy Phase II	Media Lab Asia	72.00 Lakhs
2.	A Low cost Off line Internet Access System for Rural Schools	Media Lab Asia	100.00 Lakhs
3.	Advisor for Communications and Networking Plan	National Insurance Company	2.40 Lakhs
4.	Algorithms and Software for Corrosion Prediction	EXC Corporation	5.00 Lakhs
5.	Automatic Property Extraction from System Verilog Test Benches	Synopsys (India) Pvt. Ltd.	11.00 Lakhs
6.	Behavioral Modeling and Verification of Mixed-signal Circuits	National Semiconductor Corp., USA	27.00 Lakhs
7.	Call Centre & Data Warehousing	WBSEB	7.00 Lakhs
8.	Coal Net (Phase I & 2)		2725.00 Lakhs
9.	Computerized Toll bridge	Hoogly River Bridge Commissioners	10.00 Lakhs
10.	Concept Note for EDA Park	DIT, Govt. of WB	6.00 Lakhs
11.	Content Based Search in Satellite Image Repository	Defence Electronics Lab.	9.50 Lakhs
12.	Coverage metrics for design intent coverage	Intel Corporation, USA	22.50 Lakhs
13.	Deployment of Telemedicine in Tripura	MIT, GOI and WECS, Ltd., Kolkata	27.00 Lakhs
14.	Design IT Roadmap for HCL	Hindusthan Copper Ltd.	7.30 Lakhs
15.	Development of Telemedicine in West Bengal Govt. Hospitals	MIT, GOI and WEBEL, Kolkata	29.00 Lakhs
16.	Developments tools for CR-16	National Semiconductor Corporation, USA	112.50 Lakhs
17.	ERP Implementation (for Bridge & Roof)	Bridge & Roof	4.50 Lakhs

18.	External Network Consultant for West Bengal State Wide Area Network (WBSWAN) Expansion Project	MIT, GOI and WEBEL Techn. Ltd., Kolkata	30.00 Lakhs
19.	Functional Extraction for Automatic Stimulus Generation	National Semiconductor Corp., USA	22.50 Lakhs
20.	Hindi Named Entity Recognition	Microsoft Research	10.00 Lakhs
21.	HP-UX lan driver development, as project	Pursuit Software Inc.	20.00 Lakhs
22.	Interlinking of JIS campuses	JIS Group, Kolkata	1.00 Lakhs
23.	IT Consultancy	UCO Bank	2.50 Lakhs
24.	LAN Design for Vidyut Bhavan	WBSEB	0.15 Lakhs
25.	Memory Compiler	National Semiconductor Corporation, USA	50.00 Lakhs
26.	Multimodal Participatory Tutoring System for Rural Schools	Media Lab Asia	24.00 Lakhs
27.	Nabarun Core Technology	Grameen Sanchar Society, Kolkata	50.00 Lakhs
28.	Named Entity Recognition	Microsoft Research Inc.	10.00 Lakhs
29.	Named Entity Recognition and Part of Speech tagging for Hindi	Microsoft Research India	10.00 Lakhs
30.	Object-Oriented (C#.NET centric) Courseware Development	Microsoft Corp., USA	11.00 Lakhs
31.	Personalized content and commerce recommendations	Minekey Inc.	45.00 Lakhs
32.	Position Paper on Development of Semiconductor Facility	Xenitis Infotech.	3.75 Lakhs
33.	Prototype Development of Interferential Therapy Set	Medonics & Co., Kolkata	0.40 Lakhs
34.	Prototype Development of Ultrasonic Therapy Set	Medonics & Co., Kolkata	0.40 Lakhs
35.	Real Time Simulation	Vision Comptech Ltd., Kolkata	4.00 Lakhs
36.	Road Map for ERP	DVC	1.00 Lakhs
37.	Roadmap for ERP Implementation for DVC	Damodar valley Corporation	1.00 Lakhs
38.	Setting up of Telemedicine Facilities in Tripura	MIT, GOI, and WEBEL, Kolkata	27.00 Lakhs
39.	Shruti: Embedded Text to Speech Systems for Indian Languages Phase II	Media Lab Asia	21.00 Lakhs
40.	Software Databases and Models	Orrick, USA	2.20 Lakhs
41.	Software Tools for Embedded Systems	National Semiconductor Corporation, USA	50.00 Lakhs
42.	Synthesis and Property Extraction from System Verilog Models	Synopsys India Pvt Ltd.	26.00 Lakhs
43.	Technical Consultancy on IT Matters	UCO Bank	1.00 Lakhs

44.	Telemedicine	WEBEL	29.00 Lakhs
45.	Telemedicine	WEBEL	29.00 Lakhs
46.	Telmedicine	WEBEL	36.00 Lakhs
47.	Template Extraction	National Semiconductor Corporation, USA	100.00 Lakhs
48.	Toll Booth for Vidyasagar Setu	HRBC	9.50 Lakhs
49.	Training and Research Analysis	Infosys Ltd., Bangalore	1.60 Lakhs
50.	Verification in Virtual Silicon	Virtio Corporation	50.00 Lakhs
51.	Verification of UML Models	General Motors	23.00 Lakhs
52.	W.B. State Wide Area Network	WTL	30.00 Lakhs
53.	Zonal Data Warehouse and Online CRM Project of CRM	West Bengal State Electricity Board	7.00 Lakhs

#### **VISITS ABROAD BY FACULTY MEMBER**

1.	Prof. Arun Kumar Majumder	Research Collaboration on Secure Information Systems Design (Centre for Secure Information Systems, George Mason University, Fairfax, Virginia, USA) June
2.	Prof. Pallab Dasgupta	Tutorial Presentation at Design Automation Conference, and Industry visits (Santa Clara and San Diego, California, USA) 10 days
3.	Prof. Rajeev Kumar	Paper presentation at FDL-06 Conference and Seminars at Technology University (TU) Darmstadt (Darmstadt, Germany) 1 week
4.	Prof. Rajeev Kumar	Paper presentation at EMO-2007 Conference (Matsushima, Japan) 1 week
5.	Prof. Rajeev Kumar	Paper presentation at SAC-2007 and Seminar at GIST, Gwangju (Seoul and Gwangju, Korea) 1 week
6.	Prof. Rajeev Kumar	Paper presentation and Tutorial delivery (London, UK) 1 week
7.	Prof. Dipanwita Roychowdhury	To present paper in Conference (Perpignan, France) 7 days
8.	Prof. Dipanwita Roychowdhury	To present paper in onference (Townsville, Australia) 7 days
9.	Prof. Indranil Sengupta	Presenting paper in TENCON 2006 Conference (Hong Kong) November 14-17
10.	Prof. Indranil Sengupta	Attending Steering Committee Meeting of Asian Test Symposium (ATS'06) (Fukuoka, Japan) November 20-23
11.	Prof. Ajit Pal	Attending a Conference (Pennang, Malaysia) 5 days
12.	Prof. Ajit Pal	Attending a Conference (Singapore) 4 days
13.	Dr. Niloy Ganguly	Indo-German Project (Dresden, Germany) 1.5 months
14.	Dr. Niloy Ganguly	Conference Presentation (Italy) 1 week

- |     |                                 |  |
|-----|---------------------------------|--|
| 15. | Dr. Niloy Ganguly               | Conference Presentation (Prague)           |
| 16. | Prof. Partha Pratim Chakrabarti | IST Conference (Helsinki, ) November 21-24 |

#### INVITED LECTURES BY FACULTY MEMBERS

- |     |                              |   |
|-----|------------------------------|---|
| 1.  | Prof. Sudebkumar Prasant Pal | Elements of quantum parallelism and algorithms (Haldia Institute of Technology, Haldia, West Bengal)  |
| 2.  | Prof. Sudebkumar Prasant Pal | On the communication complexity of certain hypergraph vertex 2-colouring games (Indo-US workshop on soft, quantum and nano computing, SQUAN 2007, Dayalbagh (Deemed University, Agra) |
| 3.  | Dr. Pabitra Mitra            | Computing on Data Streams (ISI Calcutta)  |
| 4.  | Prof. Arun Kumar Majumder    | Content Based Image and Video Retrieval (University of Iowa, Iowa City, USA Content Based Image and Video Retrieval)  |
| 5.  | Prof. Sudeshna Sarkar        | a) Shallow Parsing<br>b) Named Entity Recognition (MSR India Summer School on Natural Language Processing)  |
| 6.  | Prof. Sudeshna Sarkar        | a) Machine Learning<br>b) Statistical methods for IR<br>c) Word Sense Disambiguation<br>d) Named Entity Recog (LAICS-NLP Summer School, Kasetsart University, Bangkok)                |
| 7.  | Prof. Pallab Dasgupta        | NSVL Distinguished Professor Lecture : Verifiable Methods for Integrating Power Management ICs (National Semiconductor Corp, Santa Clara, California, USA)                            |
| 8.  | Prof. Rajeev Kumar           | Multiple polymorphic arguments in object-oriented languages (Technology University Darmstadt, Germany)  |
| 9.  | Prof. Rajeev Kumar           | Video Transcoding : Algorithms and Architectures (Technology University Darmstadt, Germany)   |
| 10. | Prof. Rajeev Kumar           | Evolutionary Combinatorial Optimization : Solving Hard Problems (University Institute of Engineering & Technology, Kanpur University)   |
| 11. | Prof. Rajeev Kumar           | Embedded Systems : Design and Validation (Gwangju Institute of Science & Technology (GIST), S. Korea)   |
| 12. | Prof. Rajeev Kumar           | Virtual Execution Environments : Emerging Run-time Systems in Object Oriented Computing (Department of Computer Science & Technology, NIT Rourkela)                                   |
| 13. | Prof. Sudeshna Sarkar        | Information Retrieval aka Search Engine - The Challenges for Indian languages (IEEE WIE National Symposium on Emerging Technologies, Kolkata)   |

## THESES : DOCTORAL AND MS

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

## BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	Prof. Rajib Mall	Real-Time Systems: Theory and Practice	Pearson Education	2007

## PATENTS GRANTED

1. Method and Apparatus for providing a binary fingerprint image
2. Sanyog: A Multimodal Communication Tool for Children with Cerebral Palsy

## LAURELS & DISTINCTIONS

1. Prof. Partha Pratim Chakrabarti INAE Visveswarya Chair Professor (2007)
2. Dr. Pabitra Mitra Royal Society UK, India-UK Science Network Award (2006)
3. Prof. Rajeev Kumar Senior Member – ACM (2007)

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

1. 7th International Workshop on Distributed Computing (IWDC 2005)
2. FSTTCS, Foundations of Software Technology and Theoretical Computer Science
3. IEEE Asia Pacific Software Engineering Conference (APSEC), 2006
4. Indian Conference on Medical Informatics and Telemedicine
5. International Symposium on Algorithms and Computation (ISAAC)
6. International Workshop on Digital Library
7. Language, Artificial Intelligence and Computer Science NLP summer school
8. Microcontroller based Embedded Systems
9. MSR India Summer School on Natural Language Processing
10. Computer Network Management (3 weeks, June 2006)
11. IEP on Low Power VLSI design (2 weeks)
12. Information Security (12 days)



## DEPARTMENT OF ELECTRICAL ENGINEERING

**HEAD : Professor Sarit Kumar Das**

### **FACULTY**

#### **Professor :**

Bandopadhyay, Soumitro	Ph.D. (IIT Delhi), Nonlinear Dynamics
Barua, Alok	Ph.D. (IIT Kharagpur), Instrumentation, VLSI
Basu, Tapan Kumar	Ph.D. (IIT Delhi), Power Systems and Dig. Sig. Processing, Power Systems, DSP, Speech Processing
Bhattacharya, Tapas Kumar	Ph.D. (IIT Kharagpur), Electrical Machines & Drives, Circuits, Electromagnetics, LIM., Transformer, Inrush Current Minimization
Das, Debapriya	Ph.D. (IIT Delhi), Power System Engineering
Das, Sarit Kumar	Ph.D. (IIT Kharagpur), Control Systems
Dutta, Pranab Kumar	Ph.D. (IIT Kharagpur), Signal Processing, Instrumentation, Image Processing
Kishore, N. K.	Ph.D. (IISc Bangalore), Power Systems & Energy Engineering, High Voltage & Insulation Engineering
Mohan, Bosukonda Murali	Ph.D. (IIT Kharagpur), Control Systems
Mukhopadhyay, Siddhartha	Ph.D. (IIT Kharagpur), CAD and Testing of Mixed Signal VLSI, Instrumentation, Control and Automation, Estimation, Monitoring and Diagnosis, Aerospace Control, Tracking and Guidance
Pal, Jayanta	Ph.D. (IIT Roorkee), Control System, Power System
Patra, Amit	Ph.D. (IIT Kharagpur), Control Systems, Power Electronics
Ray, Goshaidas	Ph.D. (IIT Delhi), Control System Engineering
Sen Gupta, Sabyasachi	Ph.D. (IIT Kharagpur), Machine Drives and Power Electronics
Sen, Siddhartha	Ph.D. (IIT Kharagpur), Instrumentation, Control Systems
Sinha, Avinash Kumar	Ph.D. (Pilani), Power Systems Engineering

#### **Associate Professor :**

Chakraborty, Chandan	Ph.D. (IIT Kharagpur), Ph.D. (Japan), Machines, Drives and Power Electronics
Kastha, Debaprasad	Ph.D. (Tennessee), Machine Drives and Power Electronics
Maka, Srinivasu	Ph.D. (IIT Kharagpur), Control Systems, Instrumentation Engineering, Biomedical Engineering
Pradhan, Ashok Kumar	Ph.D. (Sambalpur University), Power System Relaying, Power Quality, Digital Signal Processing

Routray, Aurobinda                      Ph.D. (Sambalpur University), Development of Real Time DSP Algorithms, Intelligent Signal Processing, Real Time Embedded Systems

**Assistant Professor :**

Chattopadhyay, Souvik                      Ph.D. (IISc. Bangalore), Power Electronics  
Mukherjee, Anirban                      Ph.D. (IIT Kharagpur), Instrumentation  
Poddar, Gautam                      Ph.D. (IISc Bangalore), Power Electronics and Drives  
Sahoo, Nirad Chandra                      Ph.D. (University of Singapore), Applications of Soft Computing, Applications of Control Theory to Power Systems and Electric Drives

**Lecturer :**

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

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

**Faculty Appointment :**

Dr. Nirad Chandra Sahoo                      Assistant professor  
Dr. Alok Kanti Deb                      Lecturer

**Faculty Promotion :**

Prof. Tapas Kumar Bhattacharya                      Professor  
Prof. Das, Debapriya Das                      Professor  
Prof. Murali Mohan Bosukonda                      Professor  
Prof. Sabyasachi Sen Gupta                      Professor  
Dr. Ashok Kumar Pradhan                      Associate Professor

**RESEARCH AND DEVELOPMENT**

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

The major on-going activities are categorized as follows :

**Machine Drives and Power Electronics :**

1. Magnetic Levitation
2. Superconducting magnetic energy storage
3. Variable frequency AC-Drives
4. Simulation of power electronic circuits
5. Resonant Converters
6. Design of integrated circuits for Power Management
7. Nonlinear phenomena in Power Electronics
8. Automotive Electronics
9. Diagnostic of drives
10. Drive fatigue analysis

**Control and Dynamic Systems :**

1. Neuro-fuzzy controllers
2. Control of chaotic systems
3. Discrete event and hybrid systems
4. Fault-tolerant control of aero-space systems
5. Attitude control of satellites and launch vehicles
6. Robust stabilization using periodic controllers
7. Reduced order modeling
8. Control of Variable Air-Volume Air-Conditioning Systems
9. Bifurcation theory of hybrid dynamical systems
10. Delta domain digital control analysis and design
11. Neural networks applications in control
12. Genetic algorithm applications in control
13. Decentralized control of large scale systems
14. Nonlinear dynamics
15. Fractional order system and their applications

**Power and Energy Systems :**

1. Wind turbines
2. Power system dynamics
3. Real-time digital simulation of power systems
4. Power system protection
5. Intelligent relaying
6. State estimation of power systems
7. Condition and Diagnostic Monitoring of Power Apparatus
8. Energy audit and management
9. Power system planning and optimisation
10. Wavelet Application to Power system Transients
11. Neural Net Application to Partial Discharge Phenomenon
12. Electric Field Computations, Lightning Protection, Material Characterization
13. FACTS

**Instrumentation and Signal Processing :**

1. Laser based profile measurement
2. Image based measurement systems
3. Motion estimation using MRI and colour Doppler imaging
4. Non-Linear and Statistical Signal Processing
5. Real Time Algorithms for Detection and Diagnostics
6. Condition monitoring of machines and power apparatus
7. Testing of analog and digital VLSI circuits
8. Fault detection and diagnosis of analog circuits
9. Control and instrumentation of bio-reactors
10. Fibre-optic components and sensors
11. Biomedical signal processing
12. Analysis of ECG signals
13. Sensors fusion
14. Multimedia Security
15. Convex Optimization and LMI applications to Signal Processing
16. Design and development of MEMS accelerometer
17. Seismic signal processing, active noise control
18. Fast algorithms for real time signal processing

An on-going major design work is on “Design of an Active Noise Controller”

**Thrust Areas :**

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

1. MEMS
2. VLSI applications in power converters
3. Automotive electronics and electric vehicles
4. Non conventional energy
5. Control of aerospace systems
6. Bifurcation and chaos
7. Fault tolerant and embedded system
8. Distributed generation
9. FACTS

**ON-GOING RESEARCH PROJECTS****Sponsored Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Application of Chaos in DC/DC Converters for Reduction of EMI	ISRO	8.60 Lakhs
2.	Artificial Heart Development Program	DST, New Delhi	8.16 Lakhs
3.	Attitude control of launch vehicles	ISRO, IIT Kharagpur Cell	2.70 Lakhs
4.	AVLSI Consortium	Multiple Organizations in India and Abroad	100.00 Lakhs
5.	Cultural Dimension in Digital Multimedia Security Technology	EU-India Cross Cultural Program, New Delhi	35.00 Lakhs
6.	Cultural Dimension of Digital Multimedia Security Technique	EU-India	35.00 Lakhs
7.	Design & Development of a Signal Processing System-on-chip for Microsensors	Ministry of Human Resource Development	6.00 Lakhs
8.	Design & Development of Spark Plasma Sintering facility for Nanomaterial Compaction	Ministry of Human Resources Development	20.00 Lakhs
9.	Design and Development of a Low Power General Purpose ASIC Chip for Telemedicine Applications	Ministry of Human Resource Development	10.00 Lakhs
10.	Design and Development of a signal processing System-on-Chip (SOC) for Micro-sensors	Ministry of Human Resource Development	6.00 Lakhs
11.	Design of a MEMS based Capacitance Accelerometer	ISRO (Space Technology Cell)	4.80 Lakhs
12.	Design of algorithm target for an embedded redundancy management system for fault tolerance of an electric actuator	Defence Research and Development Laboratory	4.95 Lakhs

13.	Design of Algorithms for Secure Energy Management	Ministry of Power, Gol, Bangalore	24.00 Lakhs
14.	Design of an optimal control strategy for GSLV MK3	Indian Space Research Organization	2.00 Lakhs
15.	Development and Assessment of Modern Multivariable Fault-Tolerant Control Design Paradigm for Aerospace Applications	Aeronautical Research and Development Board	8.35 Lakhs
16.	Development and testing of real-time algorithms for fault tolerance of aerospace applications	Aeronautical Development Establishment, Bangalore	8.00 Lakhs
17.	Development Decision Support Tools for secure management	Central Power Research Institute, Bangalore, Ministry of Power	26.00 Lakhs
18.	Development of a Low Cost On-Line Distribution Monitoring Device with Wireless Local Loop Capability	Central Power Research Institute, Bangalore	25.44 Lakhs
19.	Development of an Automotive Electronics Laboratory	MHRD	16.00 Lakhs
20.	Development of an Autonomous Underwater Vehicle	DoD, Gol	267.00 Lakhs
21.	Development of an Economical Variable Speed Constant Frequency Generation System Suitable for Wind Power Generation	Central Power Research Institute, Bangalore	26.00 Lakhs
22.	Development of an intelligent, embedded sensor system for measuring thermal, electrical & hydraulic properties of soil	DST India	15.00 Lakhs
23.	Development of Decision Support Tools for Secure Energy Management	Central Power Research Institute, Bangalore	24.70 Lakhs
24.	Development of intelligent FDIR scheme for a complex electro-hydraulic actuation system	ISRO, Govt. of India	9.00 Lakhs
25.	Development of low cost on-line distribution monitoring device with wireless local loop capability	Central Power Research Institute	25.00 Lakhs
26.	Development of MEMS based Capacitive Accelerometer	DIT, Govt. of India	103.00 Lakhs
27.	Development of methods in design for test (DFT), built-in self-test (BIST) for mixed signal VLSI circuits and systems for mission-critical application	Indian Space Research Organization, Thiruvananthapuram	9.00 Lakhs
28.	Development of Microscopic Imaging System for Dynamic Study of Fundamental Organisms (Fungus)	IIT Kharagpur	3.00 Lakhs

29.	Development of on line Distribution monitoring device with WLL capability	CPRI, Bangalore	25.00 Lakhs
30.	Development of Sesors for Gas-Liquid and Liquid-Liquid Flow	MHRD, Govt. of India	14.00 Lakhs
31.	Development of Software Tools and Methods for Design of Test and Built-in Self-Test for Mixed-signal VLSI Circuits and Systems	Ministry of Human Resource Development	17.00 Lakhs
32.	Development of the theory of nonsmooth bifurcations in hybrid dynamical systems	BRNS, DAE	7.00 Lakhs
33.	Development of Voltage Regulator IC	ISRO, GOI	14.00 Lakhs
34.	Digital Control of Voltage Regulator Modules	IIT Kharagpur	3.00 Lakhs
35.	Distribution Reforms Upgrades Management	Ministry of Power & USAID	0.00 Lakhs
36.	Full Spectrum Real Time Digital Simulator	C-DAC, Trivandrum	5.47 Lakhs
37.	Implementation of Digital Current-Mode Control in Field Programmable Gate Array (FPGA) Devices for High Frequency (>500 kHz) DC-DC Converters	Dept. of Science and Technology, Govt. of India	22.88 Lakhs
38.	National Mission on Power Electronics Technology	Ministry of Communications And Information Technology, GOI	70.00 Lakhs
39.	Non-classical Approaches to Auto-pilot Design in Tactical Aerospace Vehicles	DRDL, Hyderabad	4.95 Lakhs
40.	Seeker, Radar and INS data fusion and filtering for kinematic state estimation of aerospace targets	Ministry of Defense, Govt. of India	24.75 Lakhs

**Consultancy Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Behavioral Modeling and Top-Down Design of Switching Converter ICs	National Semiconductor Corporation, USA	50.00 Lakhs
2.	Behavioral modeling and Verification of Analog and Mixed Signal Designs	National Semiconductor Corporation, USA	50.00 Lakhs
3.	Behavioral Modeling of Power Converters	National Semiconductor Corporation, USA	60.00 Lakhs
4.	Behavioral Modelling of Operational Amplifiers	National Semiconductor Corporation, USA	30.00 Lakhs
5.	Bus Paralleling Controller with CAN Interface	C-DAC, Trivandrum	1.50 Lakhs

6.	Development of Online Surface Inspection System for Hot Rolled flat Products	RDCIS, SAIL	10.00 Lakhs
7.	Development of Parameterized Templates and R-extraction Tools	National Semiconductor Corporation, USA	90.00 Lakhs
8.	Development of performance monitoring system for critical stand motors of Rail & Structural Mill, Bhilai Steel Plant	RDCIS, Ranchi	6.10 Lakhs
9.	Diagnostics of DC Drives	RDCIS Ranchi	10.00 Lakhs
10.	Discipline Coordinator, EE for NPTEL	MHRD, Govt of India	0.00 Lakhs
11.	Electronic paralleling of UPS System	C-DAC, Trivandrum	01.00 Lakhs
12.	SME for Video and Web Courses for NPTEL	MHRD, Govt of India	0.00 Lakhs

#### VISITS ABROAD BY FACULTY MEMBER

1.	Dr. Ashok Kumar Pradhan	Research (Hydro-Quebec Research Institute and McGill University Canada) 10 months
2.	Prof. Soumitro Bandopadhyay	Collaborative research (Newcastle University, UK) May 17 to June 15
3.	Prof. Murali Mohan Bosukonda	Served as a Visiting Professor (Department of Electrical Engineering - Systems, University of Southern California, Los Angeles) 4.5 months
4.	Prof. Pranab Kumar Dutta	Eu project meeting and workshop (Florence, Italy)
5.	Prof. Pranab Kumar Dutta	Conference (Las Vegas, USA)
6.	Prof. N. K. Kishore	To attend IEEE ICIIS, Present papers and chair a session (Kandy Sri Lanka) August 7-12
7.	Prof. N. K. Kishore	To attend IEEE CEIDP, present papers, organise a session and attend CEIDP TPC meeting (Kansas City USA) October 13-17, 2006
8.	Prof. N. K. Kishore	To represent IEEE Kharagpur Section in IEEE Region 10 meet (Kota Kinabalu, Sabah, Malaysia) March 24-25, 2007
9.	Prof. Soumitro Bandopadhyay	Collaborative research (Beijing University of Aeronautics and Astronautics (BUAA, China) June 28 to July 18
10.	Prof. Siddhartha Mukhopadhyay	Technical Interaction on Collaborative research (National Semiconductor Corporation, Santa Clara, California, USA) July 2-9
11.	Prof. Tapan Kumar Basu	Attending Conferences for paper presentation and Project group meeting (Tech. Univ., Toulouse, France) May 9-11, 2006
12.	Prof. Tapan Kumar Basu	Attending Conferences for paper presentation and Project group meeting (University of Florence, Italy) November 7-10, 2006

### LECTURE BY VISITING EXPERT

1. Mr. S. Vathasal, Director, ERIP, DRDO, New Delhi Current Trends in Tactical Missile Guidance
2. Mr. Arvind Jadhav, Joint Secretary, Ministry of Power, New Delhi Emerging issues in the power sector
3. Dr Amitava Chatterjee Scaling of Advance C-MOS VLSI
4. Prof. Nikhil Ranjan Pal, ISI, Kolkata On-line feature analysis in neural and neuro fuzzy framework
5. Dr. Soumya Mukherjee, IIT, Bombay Instrumentation for the heart

### INVITED LECTURES BY FACULTY MEMBERS

1. Dr. Aurobinda Routray Computational Methods and MATLAB (BITS, Mesra)
2. Dr. Aurobinda Routray Emotion Analysis: an Instrumentatiin Prospective (NIT Rourkela)
3. Dr. Aurobinda Routray Seismic Signal Processing (NIT Rourkela)
4. Dr. Ashok Kumar Pradhan Evolving Power System Protection (College of Engineering, Bhubaneswar)
5. Dr. Ashok Kumar Pradhan Power Quality (West Bengal Electricity Board)
6. Prof. Soumitro Bandopadhyay On the Stability of periodic orbits in hybrid dynamical systems (Newcastle University, UK)
7. Prof. Soumitro Bandopadhyay The character of impact map in hybrid dynamical systems (University of Aberdeen, UK)
8. Prof. Siddhartha Sen Process control (Damodar Valley Corporation, Kolkata)
9. Prof. Murali Mohan Bosukonda Fuzzy PI / PD Controllers – Mathematical Models and Analysis (Department of Electrical Engineering - Systems, University of Southern California, Los Angeles)
10. Prof. N. K. Kishore Lightning Phenomenon (IIT Madras)
11. Prof. N. K. Kishore Lightning Phenomenon (BESU Calcutta)
12. Prof. N. K. Kishore Demand Side Management (VIIT, Duvvada, near Visakhapatnam)
13. Prof. N. K. Kishore Electrical Safety N K (IIT Kharagpur - REC Short Term Course)
14. Prof. N. K. Kishore Electrical Safety (IIT Kharagpur - REC Short Term Course @ Calcutta)
15. Prof. N. K. Kishore Power Plant (IIT Kharagpur - Metallurgy Shor term course)
16. Prof. N. K. Kishore Electrical Safety at High Voltages (VECC Calcutta)
17. Prof. N. K. Kishore Lectures on Lightning & Electrical Safety (Sarathi Institute of Technology)



18.	Prof. N. K. Kishore	Insulation in Electric Power Apparatus (IEEE Kharagpur Section)
19.	Prof. Amit Patra	Power Management Circuits (NIT Jamshedpur)
20.	Prof. N. K. Kishore	Overview of Power Transformers (NHPC Singtam, Sikkim)
21.	Prof. N. K. Kishore	Overview of Circuit Breakers (NHPC, Singtam, Sikkim)
22.	Prof. N. K. Kishore	Overview of Vacuum Circuit Breakers (NHPC, Singtam, Sikkim)
23.	Prof. Soumitro Bandopadhyay	Nonlinear Phenomena in Power Electronics (Beijing University of Aeronautics and Astronautics (BUAA, China)
24.	Prof. Soumitro Bandopadhyay	Theory of Border collision bifurcations by Bandopadhyay, Soumitro (Newcastle University, UK)
25.	Prof. Soumitro Bandopadhyay	On the nature of the impact map in switching systems (University of Aberdeen, UK)
26.	Prof. Soumitro Bandopadhyay	Introduction to nonsmooth bifurcations (Second International Workshop on Complex Systems and Networks, Vancouver, Canada)
27.	Prof. Siddhartha Mukhopadhyay	Intelligent Virtual Sensing (GM, India Science Lab, Bangalore)
28.	Prof. Siddhartha Mukhopadhyay	Estimation of Signals and Systems (John. F. Welch Technology Center, GE, Bangalore)
29.	Prof. Siddhartha Mukhopadhyay	Behavioral Modelling of Circuits (National Semiconductor Corporation, Santa Clara, USA)
30.	Prof. Siddhartha Mukhopadhyay	Introduction to Discrete Event and Hybrid Systems (ABB Corporate Research Center, Bangalore)
31.	Prof. Siddhartha Mukhopadhyay	Advanced Autopilot Design for a Surface-to-Surface tactical Missile (Space Technology Center, Department of Aerospace Engineering, IISc. Bangalore)
32.	Prof. Siddhartha Mukhopadhyay	Process Automation, Diagnostics and Embedded Ssystems (DVC Headquarters, Kolkata)
33.	Dr. Srinivasu Maka	Instrumentation (Damodar Vally Corporation, Kolkata)

#### THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	Soumya Rajan Mohanty	Detection and Classification of Transmission Line Faults
2.	Partha Sarathi Bera	Some Aspects of Dynamic Stability of Power Systems
3.	Karabi Biswas	Studies on Design, Development and Performance Analysis of Capacitive type Sensors

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|-----|------------------------|--|
| 4.  | Bibhu Prasad Panigrahi | Studies on Direct Torque Control of Squirrel Cage Induction Motor  |
| 5.  | Jayati Dey             | Periodic Compensation of Continuous-time Plants  |
| 6.  | Arpita Sinha           | Fuzzy PID Controllers: Mathematical Models and Analysis  |
| 7.  | Ardhendhu Saha         | Development and Characterization of Diode Pumped Nd: YAG Laser emitting around 1.3 micron and its Frequency Conversion |
| 8.  | Jitendra Kumar Agrawal | Design and Implementation of a Single-chip Controller for Multi-phase Interleaved Buck Converters                      |
| 9.  | Abhijit Das            | Nonlinear Design of Three-axes Autopilot for Short-range Skid-to-turn Surface-to-surface Homing Missiles               |
| 10. | Gautam Maji            | Development of a Battery Monitoring system for an Automatic Underwater Vehicle   |
| 11. | Siddhartha Swarnakar   | Fault Tolerance in Brushless DC Motor Drives for Position Servo Applications   |
| 12. | Pradipta Patra         | Design and On-Chip Implementation of Single-Inductor Triple-Output DC-DC Buck Converter                                |

#### **PATENTS GRANTED**

1. A Pumping System for Increasing Pressure of Blood / Fluid in a Controlled and Stepwise Mode
2. Electronic circuits for protection of S.C coil against over-voltages and for fast detection and protection of S.C. coil against quench

#### **LAURELS & DISTINCTIONS**

1. Prof. Soumitra Bandopadhyay      Fellow of the Indian Academy of Sciences, Bangalore (2005)
2. Dr. Chandan Chakraborty      Member-at-Large (ADCOM Member) - IEEE Industrial Electronics Society (2007)

## DEPARTMENT OF ELECTRONICS & ELECTRICAL COMMUNICATION ENGINEERING

**HEAD : Professor Debasish Datta**

### **FACULTY**

#### **Professor :**

Banerjee, Swapna	Ph.D. (IIT Kharagpur), Microelectronics & VLSI Design
Biswas, Juran Chandra	Ph.D. (Allahabad), Fibre Optics, Superconductors
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	Ph.D. (IIT Delhi), Digital and Adaptive Signal Processing, VLSI for Signal Processing, Signal Processing for Wireless Communication
Datta, Debasish	Ph.D. (IIT Kharagpur), Telecommunications
Gangopadhyay, Ranjan	Ph.D. (IIT Kharagpur), Wireless and Fibre Optic Communication
Garg, Ramesh	Ph.D. (IIT Kanpur), Microwave and RF Engineering
Kal, Santiram	Ph.D. (IIT Kharagpur), Microelectronics & VLSI, MEMS, Microsensors, Bio-MEMS
Maiti, Chinmay Kumar	Ph.D. (IIT Kharagpur), Microelectronics (Si Heterostructures)
Pal, Ranendra Nath	Ph.D. (IIT Bombay), Signal Processing
Pathak, Sant Sharan	Ph.D. (IIT Delhi), Digital Communication
Rajakumar, Ratnam Varada	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.Scatter
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, Queueing theory, Stochastic Optimization
Roy, Rajat	Ph.D. (University of Mumbai), Microwaves
Saha, Goutam	Ph.D. (IIT Kharagpur), Signal Processing, Modelling & Prediction
Srivastava, Shrinath	ME (Jabalpur University), Microwaves, Radar, EMI/EMC, RF Engineering

**Scientific Officer :**

Sahoo, Ghanashyam	Ph.D. (Jadavpur University), EMI, EMC, Microwave & Antenna
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**FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION**

**Faculty Appointment :**

Dr. Amitabha Bhattacharya	Assistant Professor
Dr. Paritosh Kumar Chakraborty	Assistant Professor
Dr. Raja Datta	Assistant Professor
Dr. Rajat Roy	Assistant Professor

**Faculty Promotion :**

Prof. Sant Sharan Pathak	Professor
Prof. Subrata Sanyal	Professor
Dr. Anindya Sundar Dhar	Associate Professor

**Faculty Retirement :**

Prof. Juran Chandra Biswas	Professor
Prof. Ranjan Gangopadhyay	Professor
Prof. Ranendra Nath Pal	Professor

## RESEARCH AND DEVELOPMENT

### Brief descriptions of on-going activities :

1. Biomedical Instrumentation:
  - i) Design and development of an embedded system-on-chip solution for an adaptive intelligent biomedical system such as low cost Doppler Ultrasonography system, and Ultrasound Imaging system.
  - ii) A non-invasive blood glucose monitor based on laser induced photo acoustic spectroscopy is under development.
  - iii) Investigations are being carried out for an early detection of oral cancer via image processing.
2. Analog/Mixed Signal Design: Currently the research group is engaged in designing an 8-bit 160 MSPS pipelined  $0.25\mu$  CMOS ADC and work is also going on to design an ADC of enhanced performance with  $0.18\mu$  BiCMOS technology.
3. Communication Systems: Research is being carried out to design a QPSK demodulator and a 9-channel Transmultiplexer for Space application.
4. Fibre Optics, Optical Communication Systems and Networking:
  - i) Transmission impairments in WDM Networks: Four wave mixing, Ultra high-speed optical binary transmission.
  - ii) Dispersion compensation of 40 Gb/s optical transmission system with optical phase conjugation and distributed Raman amplifier as well as with chirped fibre Bragg grating.
  - iii) Survivable WDM networks: Protection and restoration schemes, multiple failure scenarios, WDM-based access networks: AWG-based WDM PSN, optical CDMA.
  - iv) Design and development of efficient contention resolution schemes for packet and burst switched optical networks and their analytical modelling.
  - v) Studies are under progress in the field of Photonic Crystal Fibers (PCFs) and PCF based devices.
5. Development of a RISC DSP for Modems.
6. Development of a dual standard baseband processor for 3G Wireless Systems.
7. Data Compression: Design and implementation of parallel algorithms for lossless data compression in high-speed programmable hardware such as FPGAs.
8. EMI / EMC:
  - i) Studies on different wire antennas (e.g. dipole, inverted L, T, I, C-antennas) as Electromagnetic Interference (EMI) sensors.
  - ii) The Method of Moment based numerical technique has been used to evaluate the antenna factor of different wire antennas in different EMI test environments including Gigahertz Transverse Electromagnetic (GTEM) cell.
9. Filters: Design, simulation and fabrication of lowpass microstrip filters with cut-off frequency of 5.0GHz and bandpass waveguide filters over X and Ku-band of frequencies.
10. MCMT: The Multiple Cavity Modeling Technique (MCMT) has been applied
  - i) To study different waveguide based passive microwave circuits like waveguide diaphragms, filters, power dividers.
  - ii) For the radiator problems like wave radiators, slot radiators both in transmitting and receiving mode.
11. Development of block floating point based schemes for implementing adaptive filters in digital hardware.
12. Architectural optimization of algorithms for signal processing and wireless communication.
13. Formulation of efficient algorithms for designing CMOS operational amplifiers.
14. Image and Video Signal Processing:
  - i) Automated Visual Inspection of Industrial Objects.
  - ii) VLSI Architecture for low bit rate Video Coding
  - iii) Gesture Recognition from Video Sequences
  - iv) Face recognition
  - v) Content based Retrieval of Texture Images

15. Design and simulation of algorithms for fault diagnosis in a distributed system such as Mobile Ad-hoc Networks (MANs) and Wireless Sensor Networks
16. Development of Experimental Setups for UG and PG Classes in Telecommunication Networks Laboratory.
17. Heart Sound Analyzer - IP protection process started.

**Thrust Areas :**

1. MEMS & Semiconductor Technology
2. Wireless and Optical Communication Systems and Networks
3. VLSI Circuits and Systems
4. Computer Vision, Image and Signal Processing
5. Parallel and Distributed Systems

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Adaptive Signal Processing Using Block Floating point Arithmetic	DST	9.76 Lakhs
2.	Advanced Semiconductor Device Simulation	DRDO	23.00 Lakhs
3.	Analysis of Cavity Backed Microstrip Patch Antenna for Space Borne Phased Array Antenna	ISRO, IIT Kharagpur Cell	10.00 Lakhs
4.	Analysis of cavity backed microstrip patch antenna for space borne phased array antenna	ISRO-IIT Kharagpur Cell	3.00 Lakhs
5.	Analysis of Multilayered Planar Array Antenna using Aperture Coupled Patch Elements	ISRO, IIT Kharagpur Cell	10.00 Lakhs
6.	Analysis of multilayered planar array antenna using aperture coupled patch elements	ISRO-IIT Kharagpur Cell	3.00 Lakhs
7.	Analysis of Security Exposures to propose a Secure Architecture & Development of Tools for Intrusion Detection in Mobile Ad hoc Networks	DIT	41.48 Lakhs
8.	Analysis of Waveguide Beamformer at C & Ku Band for Space Barn Reconfigurable Beam Antenna	ISRO-IIT Kharagpur Cell	1.45 Lakhs
9.	Ant. Patterns on Satellite in Orbit Model	ISRO-IIT Kharagpur Cell	11.05 Lakhs
10.	Associated with the Project "Development of Specific Software modules for realizing Monopulse Slotted Array Antenna Using Nonstandar w/g at Ku-Band b	RCI Hyderabad	22.90 Lakhs
11.	Beam Forming Architecture for Generation of Large no. of Multiple Beams	ISRO-IIT Kharagpur Cell	2.50 Lakhs
12.	CMOS op-amp design automation in sub-micron technology	IIT Kharagpur	3.00 Lakhs
13.	Complex Biomedical Signal Analysis	DST, Govt. of India	6.50 Lakhs

14.	Content based Image Retrieval for medical Images	IIT Kharagpur	3.00 Lakhs
15.	Contoured beam synthesis for array antenna to obtain efficient footprint pattern with gain optimization	ISRO-IIT Kharagpur Cell	2.50 Lakhs
16.	Coplanar waveguide feed to dielectric resonator antenna	ISRO, IIT Kharagpur Cell	8.06 Lakhs
17.	COTS	RCI, Hyderabad	8.50 Lakhs
18.	Design and analysis of metamaterials with application in miniaturization and improvement of antenna performance	ISRO, IIT Kharagpur Cell	8.53 Lakhs
19.	Design and Development of CMOS Based 8-bit, 250 to 500 MSPS Analog to Digital and Digital to Analog Converter	SAC, ISRO, Bangalore	11.85 Lakhs
20.	Design and Development of Convergent Telecom Switch	Santech Communication Pvt. Ltd.	200.00 Lakhs
21.	Design and Development of secure routing protocols in Mobile Adhoc Networks	IIT Kharagpur	3.00 Lakhs
22.	Design and Development of Telecommunication Convergence Switch	Santech Private Limited	100.00 Lakhs
23.	Design and fabrication of high sensitivity micro machined silicon tunneling accelerometer with micro-g resolution	ISRO, IIT Kharagpur Cell	2.00 Lakhs
24.	Design and FPGA based Realization of High Speed Adaptive Equalizers	MHRD	5.00 Lakhs
25.	Design center for MEMS.devices	National Program on Smart Materials	43.00 Lakhs
26.	Design of a Hardware Accelerator for Gabor Filter Bank Based Image Processor and its Implementation on FPGA	Indian Space Research Organization (Kalpana Chawla Space Technology Cell)	3.00 Lakhs
27.	Design of Systolic Algorithms for the Efficient Compression of Real-Time Data	DST	6.42 Lakhs
28.	Development of a Lossless Compression System for Video Broadcasting	ISRO	6.00 Lakhs
29.	Development of Algorithm for Adaptive Antenna Array for Satellite Communication	ISRO-IIT, Kharagpur Cell	3.00 Lakhs
30.	Development of an advanced micromanufacturing technology characterized by micro surface quality control for BioMEMS Devices	DST / JSPS	0.00 Lakhs
31.	Development of an AUV	DOD, Govt. of India	600.00 Lakhs
32.	Development of MEMS basedcapacitive accelerometer	DIT, Govt. of India	120.00 Lakhs

33.	Development of Micromachined Inertial and Flow Sensors for Environmental and Biomedical Application	DST	113.00 Lakhs
34.	Development of non-invasive blood glucose monitor	NPSM, ADA, Bangalore	21.50 Lakhs
35.	Development of robust speaker verification system to increase security in limited user environment	DST, Govt. of India	6.42 Lakhs
36.	Development of Silicon Micromachined Accelerometer for Aircraft Motion Sensing	NPSM	212.00 Lakhs
37.	Development of silicon micromechanical accelerometer for aircraft motion sensing	NPSM	0.00 Lakhs
38.	Development of Silicon Microsensors for Flow measurement	MHRD	7.00 Lakhs
39.	Development of smart MEMS gas sensor for improvement of safety in mines	AICTE, New Delhi	3.20 Lakhs
40.	Development of software packages for waveguide-based microwave circuits	ISRO, IT Kharagpur Cell	8.00 Lakhs
41.	Development of Speaker Recognition Software for Telephone Speech	ISRO, India	7.00 Lakhs
42.	Development of speaker verification software for single to three registered user(s)	ISRO, India	10.90 Lakhs
43.	Development of Specific Software Modules for Realising Monopulse Slotted Array Antenna Using Non-Standard Wave guide at Ku-Band Along Sensitivity Anal	RCI, Hyderabad	22.90 Lakhs
44.	Development of Traditional Tongue Based Diagnostic Software Through Grabbing and Processing of Tongue Images for Storage, Retrieval and Rule Generation	Department of Science and Technology, Govt. of India, New Delhi	6.02 Lakhs
45.	Development of Video Segmentation and Coding Algorithms and Architectures for Very Low Bitrate Applications	ISRO	10.50 Lakhs
46.	DSS	RCI, Hyderabad	22.90 Lakhs
47.	Efficient testing for system-on-chip design - a new VLSI manufacturing paradigm	Department of Science & Technology, Govt. of India	9.40 Lakhs
48.	Electromagnetic modeling of High Frequency Electronic Systems to estimate Elctromagnetic Compatibility	DST, New Delhi	15.96 Lakhs
49.	Embedded Software Solutions for Digital Base-band Transceivers	ISRO, Bangalore	25.00 Lakhs
50.	Enabling Technologies for the design and implementation of next generation optical internet prototype based optical packet switching	DST Govt. of India	3.14 Lakhs



51.	Engineering enabling technologies for the design and implementation of a photonic network based on optical packet switching	MHRD	13.00 Lakhs
52.	Establishment of Nation-wide Quality of Service Network Test-Bed	DIT, New Delhi	136.00 Lakhs
53.	Experimental and theoretical studies on DNA hybridization in microchannels with electrokinetically driven flow	DST and NSF-USA	0.00 Lakhs
54.	Fabrication of silicon based microstructures for electron tunneling and applications to MEMS	DST, Govt. of India	12.00 Lakhs
55.	Feas. Comp. Foldable Ant.	ISRO, IIT Kharagpur	1.00 Lakhs
56.	Feasibility Study for the Application of Radar Technique for Detection & Mapping of Geological Faults and Water Bodies in Underground Coal Mines	CMPDI, Ranchi	16.44 Lakhs
57.	Feasibility study for the application Of Radar Technique for detection and Mapping of Geological and water Bodies in Underground Coal Mines	CMPDI Ranchi	16.44 Lakhs
58.	Feasibility Study of Anti-Jam GPS Receiver for GPS Guided Weapons	ARMREB, New Delhi	9.70 Lakhs
59.	FIST Programme on Computer Networking	DST, New Delhi	143.00 Lakhs
60.	GPS	Armament Research Board	23.90 Lakhs
61.	Indo-US Joint Centre on Advanced and Futuristic Manufacturing	Indo-US Science & Technology Forum	5.60 Lakhs
62.	Investigations of CMOS device technologies for strain-engineered MOSFETs using TCAD	Dept. of Information Technology, New Delhi	33.35 Lakhs
63.	Lossless Image Compression of Satellite Images	ISRO, IIT Kharagpur Cell	0.50 Lakhs
64.	MEMS Based Micropropulsion Devices for Microsatellite Program	ISRO	122.96 Lakhs
65.	MEMS Technology for Micromachined Silicon Microsensors	DRDO	51.00 Lakhs
66.	Modeling of Software Simulation Tool for Designing of WDM Trans. System	DST, New Delhi	10.53 Lakhs
67.	Modernisation of Fibre Optic System Laboratory for Undergraduate and Postgraduate Students	MHRD, New Delhi	8.00 Lakhs
68.	Modernisation of Integrated Circuit and System Laboratory	MHRD, New Delhi	8.00 Lakhs
69.	Nationally Coordinated Project on Telematics	MHRD, New Delhi	137.00 Lakhs
70.	Network-on-Chip testing	IIT Kharagpur	3.00 Lakhs

71.	Segmentation and Interpretation of Biomedical Images	BRNS, Department of Atomic Energy	11.49 Lakhs
72.	Simulation of Constant Phase Aperture Using Microstrip Patch Antenna	ISRO, IIT Kharagpur Cell	5.00 Lakhs
73.	Strategies for power reduction during VLSI circuit testing	DIT, Govt. of India	54.05 Lakhs
74.	Studies on Com. Sys. Arch. For Software Radio	BEL, Bangalore	30.00 Lakhs
75.	Study of Matched Filter Design on Trans-receive Characteristics for a Monopole Antenna	ARDE, Pune	4.90 Lakhs
76.	The Feasibility Study For Missile-Borne Phased Array Radar To Detect Small RCS Targets Using Commercial Of The Shelf (Cots) Components	RCI, Hyderabad	8.05 Lakhs
77.	Triple Mode Quasi Elliptic Cavity Band Pass Filters for Multiplexer Application	ISRO, IIT Kharagpur Cell, Rs.3.00 Lakhs	3.00 Lakhs
78.	Turbo and other important FEC Coding Schemes	ISRO, Bangalore	20.00 Lakhs

**Consultancy Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Chemical & EM Testing and Interpretation of LPG Converters	M/S Alternate Fuel Company, Mumbai	1.50 Lakhs
2.	Chemical & EMI testing of converter	M/S Leader Auto Gas (I) Pvt. Ltd., Mumbai,	1.25 Lakhs
3.	Competence Development in Medical Imaging & Medical Informatics	Wipro Technologies, Bangalore	4.17 Lakhs
4.	Design & Processing of MEMS Microstructure for Mechanical Property Evaluation	DRDO, Hyderabad	10.00 Lakhs
5.	Design and development of vocoder	DEAL, DRDO, Dehradun	9.60 Lakhs
6.	Design of capacitive based accelerometer	DRDO	10.00 Lakhs
7.	Design of RFIC modules	National Semiconductor Corporation, USA	60.00 Lakhs
8.	Development of Educational Complex	Tirupati Assets Pvt. Ltd, Kolkata	50.00 Lakhs
9.	Development of Fast Bipolar ASIC Chips	BARC	12.00 Lakhs
10.	Development of Flow Sensors and Acoustic Sensors	BARC	14.00 Lakhs
11.	Equalizer for LiteLink	National Semiconductor Corp. Ltd.	10.00 Lakhs

12.	Image Processing Algorithm Development for Conveyor Belt Health Monitoring	Phoenix Conveyor Belt Systems GmbH, Germany	7.55 Lakhs
13.	Preparation of Vision/theme and feasibility report	Tirupati Assets Pvt. Ltd, Kolkata	15.00 Lakhs

#### **VISITS ABROAD BY FACULTY MEMBER**

1.	Prof. Mrityunjoy Chakraborty	To present paper at EUSIPCO-2006 (Florence, Italy) September 04-08, 2006
2.	Prof. Mrityunjoy Chakraborty	Visiting Professor (City University of Hong Kong) 25 days, June-July 2007
3.	Prof. Mrityunjoy Chakraborty	To present paper at ISCAS 2007 and to attend editorial board meeting of IEEE Trans. Ckts. And Sys., Part-I, (New Orleans, USA) May 27-30, 2007
4.	Prof. Ajoy Chakraborty	2007 IEEE Radio & Wireless Symposium (Long Beach, California, USA) January 09-11, 2007
5.	Prof. Ajoy Chakraborty	Return Visit (Virginia Commonwealth University, Virginia) January 15-17, 2007
6.	Prof. Ajoy Chakraborty	Collaboration (Syracuse University, USA) January 18-20, 2007
7.	Prof. Swapna Banerjee	To present the paper in the ICIS 2006 conference (Peradeniya, Srilanka) August 08-11, 2006
8.	Dr. Goutam Saha	Research Collaboration, Faculty Exchange Program (University of Southern California, Los Angeles, CA, USA) August-December 2006
9.	Dr. Goutam Saha	Research and Development (Schlumberger Inc, Houston, USA) October 2006
10.	Prof. Chinmay Kumar Maiti	To attend ICSI-5 Conference (Marseille, France) May 20-26, 2007
11.	Prof. Santiram Kal	Indo-Italy Joint Research Project (ITC-irst, Trento Italy) 15 days, May 2007
12.	Prof. Santiram Kal	Indo-US Project (University of Illinois at Urbana Champaign, USA) 15 days, July 2006
13.	Prof. Santiram Kal	Indo-US Workshop (North Western University, Evanstone, USA) 3 days, June 2007
14.	Dr. Tarun Kanti Bhattacharyya	Delivered a talk on Diamond like nanocomposite thin films for Bio-MEMS application under DST-JSPS (University of Tokyo) 1 week, February 2007
15.	Dr. Tarun Kanti Bhattacharyya	Indo-US sponsored project on Advanced and Futuristic Manufacturing (University of California, IRVINE) 3 weeks, June 2007
16.	Dr. Tarun Kanti Bhattacharyya	On going collaborative project work on RFIC design sponsored by National Semiconductor, USA (University of Twente, The Netherlands) 1 month, May 2007
17.	Dr. Tarun Kanti Bhattacharyya	Invited Speaker and participating Indo-US joint seminar on advanced and Futuristic Manufacturing (North Western University, Evanston, USA) 3 days, June 2007

18. Dr. Tarun Kanti Bhattacharyya Given a talk on Wireless Integrated Micosensors for BioMedical applications (Texas Instruments, Dallas USA) 1 day, June 2007
19. Prof. Ranjan Gangopadhyay To attend ICON Conference (Jeju Island, Korea) 6 days, September 2006
20. Prof. Ranjan Gangopadhyay To attend Scientific Evaluation Meeting (Scuola Superiore Sant'Anna, Pisa, Italy) 6 days, June 2007
21. Dr. Sudipta Mahapatra To present a paper in IASTED Intl. Conference ACST-2007 (Phuket, Thailand) April 02-04 , 2007
22. Dr. Sudipta Mahapatra Personal Visit (Singapore), April 05-06, 2007
23. Dr. Pradip Mandal Testing of IC designed in a collaborative project (sponsored by National Semiconductor) (Baskin school of engineering, California University, Santa Cruz) 1 month, May-June 2007

#### INVITED LECTURES BY FACULTY MEMBERS

1. Prof. Mrityunjoy Chakraborty A Block Floating Point Realization of the Adaptive Decision Feedback Equalizer (Department of Electrical and Computer Engineering, University of Maryland, College Park, USA; Department of Electrical and Computer Engineering, Rice University, Houston, TX, USA; Department of Electrical and Computer Engineering, Texas A&M University, College Station, TX, USA; Hong Kong University of Science and Technology) June 2007
2. Prof. Mrityunjoy Chakraborty Multiplierless Adaptive Equalizer using Pipelined CORDIC (University of Hong Kong; Chinese University of Hong Kong) July 2006
3. Dr. Sudipta Mahapatra Fault Diagnosis in Distributed Systems (NTU, Singapore) 4<sup>th</sup> April
4. Dr. Santanu Chattopadhyay Low power VLSI design (Annual Convention of Computer Society of India)
5. Prof. Ranjan Gangopadhyay Dense WDM Technology (LNM Institute of Information Technology)
6. Prof. Ranjan Gangopadhyay Design and Optimization of 40 Gb/s Optical Transmission Systems (CODEC International Conference, Kolkata)
7. Prof. Ranjan Gangopadhyay DWDM Transmission Systems and Networks (BIT, Mesra)
8. Prof. Ratnam Varada Rajakumar Recent advances in Wireless communications (CET, Bhubaneswar)
9. Prof. Ratnam Varada Rajakumar Advances in Wireless Communications (National Conference on Advanced in Communication Technology (ACT-2006), Andhra University, Visakhapatnam)
10. Prof. Ratnam Varada Rajakumar Overview of Digital Signal Processing (Workshop on Digital Signal Processing, VRS College of Engineering, Vijayawada)

11.	Prof. Ratnam Varada Rajakumar	Broadband Wireless Access (International conference on Wireless Communication and Sensor Networks (WCSN-2006), IIT, Allahabad)
12.	Prof. Ratnam Varada Rajakumar	Challenges of Technical Education in India (Workshop on Technical Education in National Scenario, NIFFT, Ranchi)
13.	Prof. Ratnam Varada Rajakumar	Recent advances in Wireless communications (Workshop on Advances in Communications, College of Engineering, Bhubaneswar)
14.	Prof. Ratnam Varada Rajakumar	Overview of Digital Signal Processing (National Level Staff Development Programme on Modern Communication Systems, KLC College of Engineering, Vijayawada)
15.	Prof. Ratnam Varada Rajakumar	Overview of Wireless Communication Systems (WOLTEC-07, MVGR College of Engineering, Vizayanagaram)
16.	Prof. Ratnam Varada Rajakumar	Overview and Applications of Digital Signal Processing (STTP on Advances in DSP, GMR Institute of Technology, Rajam)
17.	Prof. Ratnam Varada Rajakumar	Panel Discussion on On-line Access of Technical Papers (NCIMDiL-2006, IIT, Kharagpur)
18.	Prof. Ratnam Varada Rajakumar	Advances in Wireless Communications (TechForum 2006, WIPRO, Kolkata)
19.	Prof. Ratnam Varada Rajakumar	Panel Discussion on "Innovation can be Taught" (ChemInsight, IIT, Kharagpur)
20.	Prof. Ajoy Chakraborty	Electromagnetic Interference and Compatibility (EMI/EMC) (Osmania University)
21.	Prof. Ajoy Chakraborty	Mast Clamped Current Probe Antennae (Naval EMC Unit, INS Valsura, Jamnagar)
22.	Prof. Ajoy Chakraborty	EMI/EMC (Army Centre for Electromagnetics, Mhow, MP)
23.	Prof. Ajoy Chakraborty	EMI/EMC (Army Centre for Electromagnetics, Mhow, MP)
24.	Prof. Ajoy Chakraborty	Electromagnetic Interference and Compatibility (EMI/EMC) (Military College of Electronics and Mechanical Engineering, Secunderabad)
25.	Prof. Ajoy Chakraborty	Electromagnetic Interference and Compatibility (EMI/EMC) (AU College of Engineering, Visakhapatnam)
26.	Prof. Ajoy Chakraborty	Array Antennas (KIIT University, Bhubaneswar)

#### BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	Prof. C K Maiti, Dr. S Chattopadhyay and L K Bera	Straied-Si Heterostructure Field Effect Devices	CRC Press (Taylor and Francis), USA	2007

- |    |                      |                 |                           |      |
|----|----------------------|-----------------|---------------------------|------|
| 2. | Dr. S. Chattopadhyay | System Software | Prentice Hall of<br>India | 2006 |
|----|----------------------|-----------------|---------------------------|------|

#### **PATENTS GRANTED**

1. An improved apparatus for Ultrasonography using a continuous wave Doppler system
2. Current mode differential I/O buffer for high speed off-chip interconnect
3. Non-invasive blood glucose measuring system
4. Single-ended to differential converter circuit.

#### **LAURELS & DISTINCTIONS**

- |    |                              |   |
|----|------------------------------|---|
| 1. | Prof. Mrityunjoy Chakraborty | Invited to join the editorial board of IEEE transactions on Circuits and Systems, Part I (2006-2007)                                |
| 2. | Prof. Ranjan Gangopadhyay    | Advisory Committee Member, Scuola Superiore Sant'Anna, Pisa, Italy (2006)   |
| 3. | Prof. Mrityunjoy Chakraborty | Invited as a guest editor for a special issue of the EURASIP JASP on Distributed Space Time Processing                              |
| 4. | Prof. Mrityunjoy Chakraborty | Served as a technical committee member of the IEEE International Conference on Communications (ICC-2006), Glassgow, U.K., July 2006 |
| 5. | Dr. Sudipta Mukhopadhyay     | Elected as fellow of Systems Society of India (SSI) on September 19, 2006.  |

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

- |     |   |                           |
|-----|---|---------------------------|
| 1.  | International Workshop on MEMS and Micro / Nano systems technology for Bio-implants and Bio application |                           |
| 2.  | Software Aided Statistical Data Analysis  |                           |
| 3.  | A Short Course on C++ and JAVA  | May 28 – June 15, 2007    |
| 4.  | DSP Tools and Practice  | June 04-09, 2007          |
| 5.  | Embedded Systems and Technology   | June 25-30, 2007          |
| 6.  | HAL Management and Design Trainees (AVIONICS)   | Autumn, 2006              |
| 7.  | HAL Management and Design Trainees (AVIONICS)   | Spring 2006               |
| 8.  | Microwave Laboratory Experiments based on West Bengal University of Technology curriculum               | February 03-08, 2007      |
| 9.  | Short Term Course on Image and Video Processing (Module I)  | February 19-23, 2007      |
| 10. | Short Term Course on Image and Video Processing (Module II)   | March 26 – April 04, 2007 |
| 11. | VLSI Signal Processing  | December 23-29, 2006      |

## 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. (BHU), Paleoclimatology, Paleooceanography, 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, Seismic Refraction & Reflection Methods, Geophysical Tomography, Mathematical Geophysics, Groundwater Geophysics, Geophysical Signal Processing
Sen Gupta, Debashish	Ph.D. (Gujrat), Nuclear Geophysics, Environmental Radioactivity
Tripathy, Subhasish	Ph.D. (IIT, Bombay), Environmental Geochemistry

#### **Associate Professor :**

Bhowmik, Santanu Kumar	Ph.D. (Jadavpur), 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 Kumar	Ph.D. (IIT, Kharagpur), Economic Geology, Computer Applications
Sharma, Shashi Prakash	Ph.D. (BHU), 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
Rajesh, R. S.	Ph.D. (NGRI), Geophysics: Signal Processing
Ray, Sanghamitra	Ph.D. (Calcutta), Vertebrate Palaeontology
Sanyal, Prasanta	Ph.D. (PRL), Sedimentology, Stable Isotope Geochemistry

**Lecturer :**

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

**Emeritus Professor :**

Bhattacharya, S. N. Ph.D., Seismology

**Senior Scientific Officer :**

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

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

Dr. Arindam Basu Assistant Professor

Dr. Tarun K. Dalai Assistant Professor

Dr. R. S. Rajesh Assistant Professor

**Faculty Appointed as Emeritus Professor :**

Prof. S. N. Bhattacharya Emeritus Professor

**Faculty Promotion :**

Prof. Subhasish Das Professor

Prof. Anindya Sarkar Professor

Dr. M. A. Mamtani Associate Professor

**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, Groundwater potential assessment and pollution by natural and anthropogenic causes; Waste utilization and wasteland development; Natural radiation hazard estimation.

**Thrust Areas :**

1. Seismic Hazard estimation and Microzonation
2. Deep crustal structure, crustal evolution and metallogeny
3. Ancient and modern life forms and climate



4. Environmental pollution, waste utilization
5. Monsoon dynamics

**New Acquisitions :**

1. Leica DM 4500 Research Polarizing Microscope and Leica MZ 16 Stereozoom Microscope with Image Analyzing System (Institute Grant)
2. Laser Ablation Inductively Coupled Plasma Mass Spectrometer (under installation) (FIST Phase-II of DST)
3. IR Microscope (FTIR) system with FTIR Hot-Cold Stage (under installation) (FIST Phase-II of DST)
4. Leica Differential GPS (Institute Grant)
5. CMG 3TD / 6TD Seismographs (Institute Grant)

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Tectonothermal evolution of polycyclic granulite enclaves in amphibolites from the Sandmata complex, Rajasthan : constraints from P-T evolution, petrog	DST	13.01 Lakhs
2.	Thermal and baric evolutionary history of two suites of granulite and upper amphibolite facies rocks from the sausar mobile belt in central India : Imp.	DST	9.50 Lakhs
3.	Tectono-metamorphic evolution of the Higher Himalayan rocks of Western (Kemeng Corridor) and eastern Arunachal Pradesh: A comparative Study	DST	7.42 Lakhs
4.	Establishment of Electron Probe Micro Analyzer (EPMA)-National Facility IIT, Kharagpur	DST	555.00 Lakhs
5.	Contrasting Styles Of Exhumation Of Monocyclic And Polycyclic Granulites >From The Sausar Mobile Belt In Central India: Constraints From Metamorphic P.	DST	14.03 Lakhs
6.	Investigation of alteration of cosmic dust particles: Implications for interpretation of 187Os/188Os records in marine sediments and estimates for acc	Department of Space	6.50 Lakhs
7.	Decadal Scale variability in the Indian Ocean summer monsoon during the Holocene	DST	19.50 Lakhs
8.	The exhumation factor in the genesis of inverted metamorphic sequences - an evaluation from structure, metamorphism, fluid inclusion and earthquakes i.	DST	14.0 Lakhs
9.	The Lower crustal playground in orogenesis: integrated structural, metamorphic and fluid inclusion studies on the formation and exhumation of the Angu.	DST	15.54 Lakhs

10.	Modeling and Monitoring of landslide hazard in Sikkim Himalayas	DST	22.10 Lakhs
11.	Genetic modeling of orogenic gold deposits in the Dharwar Craton: constraints from metamorphism, ore mineralogy and fluid evolution	DST	32.02 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	55.00 Lakhs
13.	Seismic Hazard Assessment of Haldia, Bengal Basin Area	DST	3.12 Lakhs
14.	Broadband seismometry in the north-east region with special emphasis to Guwahati for seismic hazard assessment	DST	10.28 Lakhs
15.	Geochemical and fluid inclusion studies on the Malanjkhand granitoid complex: Implications for ore genesis and crustal evolution. PI: M.K.Panigrahi.	DST	10.00 Lakhs
16.	Carbon isotope studies of graphite and coexisting carbonate in Eastern Ghat, Orissa: implication to the source of graphite and temperature of metamorp	IIT Kharagpur	3.00 Lakhs
17.	National Facility on Stable Isotope Geochemistry, Indian Institute of Technology, Kharagpur	DST	233.90 Lakhs
18.	A comparative structural analysis of Lonar and Ramgarh Craters for observations on impact structures on hard and soft-target rocks, and geochemical an	Physical Research Laboratory, Ahmedabad	3.62 Lakhs
19.	Natural radioactivity and radiation dosimetry in the high background radiation area along the southern coast of Orissa, India	DAE, Mumbai	8.68 Lakhs
20.	Measurement and Modeling of Radon Transport and distribution around tailing pond area and dwellings	DAE, Mumbai	17.00 Lakhs
21.	FIST Programme	DST	260.00 Lakhs

**Consultancy Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	In house training program on GPS applications to power system diagnostics	Tata Steel Ltd.	
2.	Laser Raman Microspectrometry Analysis	Industry, Academic and Governmental Organizations	2.50 Lakhs
3.	Electrical resistivity survey for delineation of Limestone formation around Chaibasa-Jharkhand	Madras Cement	2.5 Lakhs

- |    |  |                                    |            |
|----|--|------------------------------------|------------|
| 4. | Studies on Environmental Assessment of Metals in Water, Coal, River Bed Sediments and Associated Rocks around West-Bokaro Collieries | Central Coalfields Limited, Ranchi | 9.91 Lakhs |
|----|--|------------------------------------|------------|

#### **VISITS ABROAD BY FACULTY MEMBER**

- |    |                           |   |
|----|---------------------------|---|
| 1. | Dr. Manish A. Mamtani     | Research (Europe Research Fellowship of the Alexander von Humboldt Foundation, Germany) Charles University (Prague) and AGICO (Brno), Czech Republic (21 days)  |
| 2. | Dr. Manish A. Mamtani     | Research (Humboldt Research Fellowship), University of Heidelberg (Germany) (1 year)  |
| 3. | Dr. William Kumar Mohanty | Invited as Junior Associate of ICTP and Collaborative Research work with Sci. at Univ. of Trieste, The Abdus Salam International Center for Theoretical Physics (ICTP), Trieste Italy and Department of Earth Sciences, University of Trieste, Trieste, Italy (May 13, 2007 to June 30, 2007) |
| 4. | Dr. Prasanta Sanyal       | Training courses on stable isotope ratio mass spectrometer, Bremen, Germany (15 days)   |
| 5. | Prof. Anindya Sarkar      | Interacting with factory Engineer and training on Mass Spectrometer, Thermo-Fisher Corporation, Bremen, Germany (12 days)   |
| 6. | Prof. Debashish Sen Gupta | To undertake research work on Modeling of Environmental Radioactivity, Department of Applied Physics, Faculty of Experimental Sciences, University of Huelva, Spain (May 6, 2006 to August 6, 2006)   |
| 7. | Dr. Shashi Prakash Sharma | Indo-Russian discussion meeting at Troitsk Russia on Electromagnetic system for tsunami warning Moscow (June 10-17)   |
| 8. | Prof. Subhasish Tripathy  | To complete the residential requirement for the degree of Master of Laws in Intellectual Property, International Training Center of ILO, Turin and University of Turin, Italy (September 1, 2006 to December 15, 2006)  |

#### **INVITED LECTURES BY FACULTY MEMBERS**

- |    |                       |   |
|----|-----------------------|---|
| 1. | Dr. Saibal Gupta      | The structural and metamorphic evolution of the Angul area, Eastern Ghats Belt, and its implications <i>at</i> Coorg.   |
| 2. | Dr. Manish A. Mamtani | Analysis of deformation fabric in granites: integrating field, microstructural and magnetic data <i>at</i> Geologisch-Paläontologisches Institute, Universität Heidelberg, Germany (60 minutes) |
| 3. | Dr. Manish A. Mamtani | Regional strain gradients in granites-AMS and SPO measurements in the Godhra Granite, India <i>at</i> Ludwig-Maxmilians Universität München, Germany (60 minutes)                               |

4. Dr. Manish A. Mamtani Integrating mesoscopic, microstructural, magnetic and fractal dimension data from granites: implicat at Institue of Petrology & Structural Geology, Charles University, Prague, Czech Republic (60 minutes)
5. Dr. Manish A. Mamtani Evaluating strain gradients in granites at Geologie-Endogene Dynamik, RWTH Aachen, Germany (60 minutes)
6. Prof. Biswajit Mishra Genesis of Greenstone-hosted gold deposits at NGRI, Hyderabad (30 minutes)
7. Dr. Mruganka Kumar Panigrahi Thermodynamic analysis of solubilities of metals in hydrothermal fluids at Jammu University (September 19-20)
8. Dr. Prasanta Sanyal Upliftment of Himalaya, Intensification of Monsoon and Change in Ecosystem at Southern Methodist University, Dallas, Texas USA
9. Dr. Prasanta Sanyal Upliftment of Himalaya, Intensification of Monsoon and Change in Ecosystem at Caltech campus, Pasadena, USA
10. Dr. Shashi Prakash Sharma Equivalence and Suppression problems in DC. Resisitvity data interpretation at Central groundwater Board, Patna (one day)
11. Dr. Shashi Prakash Sharma VLF electromagentic methods in groundwater investigation at Central groundwater Board, Patna (one day)

#### THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	Sadhona Mahato	Thermotectonic evolution of the North Singhbhum Mobile Belt, western part of the belt
2.	Amit Basu Sarbadhikari	Polymetamorphic History of the Central Indian Tectonic Zone : Constraints from Structure, Metamorphism and Electron Microprobe Dating of Monazites
3.	Koushik Sen	Analysis of deformation fabric in the Godhra Granite, Aravalli Mountain Belt (India): an integrated field, microstructural and AMS investigation
4.	Vikas Chand Baranwal	Integrated Interpretation of VLF Data with other Geophysical Data and Study of Two-Dimensional VLF Modeling and Inversion
5.	Ajoy K. Bhowmik	Late Nogene deep sea benthic foraminifera from Blake Ridge gas hydrate (ODP Holes 994C and 997A), NW Atlantic Ocean

## LAURELS & DISTINCTIONS

1. Prof. Anil Kumar Gupta Dr. J. Coggin Brown Memorial (Gold) Medal for Geological Sciences by the MGMI, 2006
2. Prof. Anil Kumar Gupta Elected Fellow of the National Academy of Sciences, India
3. Dr. Manish A. Mamtani Europe Research Fellowship of the Alexander von Humboldt Foundation, 2006
4. Prof. Sankar Kumar Nath D N Thakur Award by MGMI, 2006
5. Prof. Sankar Kumar Nath Elected Fellow of the National Academy of Engineering
6. Prof. Biswajit Mishra National Mineral Award, 2005

## DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

**HEAD : Professor Bani Chatterjee**

### **FACULTY**

#### **Professor :**

Basu, Partha	Ph.D. (Cal), Econometrics and Statistics; Economics of Growth, Investment and Marketing
Chatterjee, Bani	M.S. (The Hague), Ph.D. (BHU), Development Planning, Sustainable Development, International Finance
Chopra Chatterjee, Suhita	Ph.D. (IIT Bombay), Sociology of Health and Medicine, Bio-Medical Ethics, Sociology of Architecture
Gera Roy, Anjali	Ph.D. (IIT Bombay), Postcolonial, Culture and Media Studies
Srivastava, K. B. L.	Ph.D (IIT Kanpur), Human Resource Development, Organizational Behaviour
Suar, Damodar	Ph.D. (IIT Kharagpur), Social and Organizational Psychology
Tewari, Hare Ram	Ph.D (IIT Kharagpur), Rural and Urban Development, Sociology of Organizations

#### **Associate Professor :**

Chakraborti, Chhanda	M.A. (University of Washington), Ph.D. (University of Utah, USA), Logic, Philosophy of Mind, Applied Ethics
Giri, Vijai Nath	Ph.D. (IIT Kharagpur), Interpersonal Communication
Nayak, Narayan Chandra	Ph.D. (Utkal), Social Sector Development, International Finance
Patnaik, Priyadarshi	Ph.D. (Utkal), Indian Aesthetics, Media and Communication Studies

#### **Assistant Professor :**

Behera, Bhagirath	Ph.D. (Bonn, Germany), New Institutional Economics, Environmental and Natural Resource Economics
Das, Saswat Samay	Ph.D. (Utkal), Postcolonial Literature, Postmodern Studies, Cultural Studies, Indian Writing in English
Goswami, Kishor	Ph.D. (IIT Kharagpur), Agricultural Economics, Development Economics
Komalesha, H. S.	Ph.D. (IIT Kharagpur), Indian English Literature, Postcolonial Studies
Mahakud, Jitendra	Ph.D. (IIT Bombay), Corporate Finance, Investment Management
Mishra, Pulak	Ph.D. (Vidyasagar University), Industrial Economics, Economics of Rural Development
Mishra, Trupti	Ph.D. (IIT Kharagpur), Environmental Economics, Industrial Economics

Murugan, Seema Ph.D. (BHU), Contemporary Afro-American Literature, Communication Skills, Dalit Literature

**Visiting Faculty :**

Kapoor, Sucheta D.Phil. (Oxford, UK), Nineteenth-century French Literature, Cultural Studies

Panda, Sudhakar Ph.D. (Utkal), Agricultural and Rural Economics

**Officer :**

Pandey, Manorath Ph.D. (IIT Kharagpur), Agronomy

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

**Faculty Appointment :**

Dr. Jitendra Mahakud Assistant Professor

Dr. H. S. Komalesha Assistant Professor

Dr. Pulak Mishra Assistant Professor

Dr. Bhagirath Behera Assistant Professor

**Faculty Promotion :**

Prof. Suhita Chopra Chatterjee Professor

Prof. K. B. L. Srivastava Professor

**Faculty Retirement :**

Dr. Manasi Sinha Associate Professor

Dr. C. P. Tyagi Assistant Professor

**RESEARCH AND DEVELOPMENT**

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

1. Quantitative Economics,
2. Economics of Growth,
3. Foreign Investment,
4. Human Resource Development,
5. Brain-behaviour Relations,
6. Interpersonal,
7. Intercultural and Organizational Communication,
8. Nonverbal Communication,
9. Visual Aesthetics

**Thrust Areas :**

1. Foreign Direct and Institutional Investment,
2. Human Resource Development,

3. Nineteenth-century Literature and Culture,
4. Nonverbal Communication.

### ON-GOING RESEARCH PROJECTS

#### Sponsored Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Side bias in motor proficiency: A human engineering programme for accident prevention and performance enhancement	DST, New Delhi	14.5 lakh
2.	Concept paper on disaster management	DIPR, Delhi	4.86 lakh
3.	Impact of Globalization and Adoption of New Technology on Silk Industry in Assam: An Assessment from Gender Perspective	DSIR, New Delhi	6.83 lakh
4.	Animated Texts: Communicating in Multimedia Environment	ICSSR, New Delhi	3.80 lakh

#### Consultancy Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Comprehensive Socio-Economic Survey of Pakri-Barwadiah Coal Mining Project	NTPC, Noida	17.0 lakh

### VISITS ABROAD BY FACULTY MEMBER

1.	Dr. C. Chakraborti	Visited USA : Paper presentation at ASPCP International Conference, University of Purdue
2.	Prof. Anjali Gera Roy	Visited Australia : Fellow, University of Technology at Sydney, 2006
3.	Prof. Anjali Gera Roy	Visited Canada : Indo-Canadian Shastri Fellowship, 2007
3.	Dr. Vijai N. Giri	Visited Germany : Research on Interpersonal Communication under DAAD-Reinvitation Programme 2007
4.	Dr. Sucheta Kapoor	Visited UK : Charles Wallace India Trust Fellow 2007, Postdoctoral project on Flaubert and India

### LECTURE BY VISITING EXPERT

1.	Prof. Amita Chatterjee, Professor of Philosophy and Coordinator, Center of Cognitive Science, Department of Philosophy, Jadavpur University, Kolkata	Philosophy in Cognitive Science
2.	Prof. Asha Mukherjee, Professor and Head, Department of Philosophy, Viswa Bharati University, Santiniketan	Jain Logic: Its Moral and Social Implications
3.	Prof. Purusottam Nayak, Professor and Head, NEHU, Shillong, Meghalay	Human Development in North Eastern States



## INVITED LECTURES BY FACULTY MEMBERS

1. Dr. Chhanda Chakraborti "Troops of Tropes : A Possible Metaphysics for the Mental", Department of HSS, IIT Bombay, February 16, 2007
2. Dr. Chhanda Chakraborti "Contemporary Challenges and Philosophy for Facing Them", Interim World Philosophy Congress and the 81<sup>st</sup> Session of Indian Philosophical Congress, New Delhi, December 16-18, 2006
3. Dr. Chhanda Chakraborti "Facts, Extra-Physical facts, and A Few Ontological Questions", Centre for Behavioral and Cognitive Science (CBCS), University of Allahabad, December 12, 2006
4. Prof. Suhita Chopra Chatterjee "Palliative Care", IVXth International Annual Conference of the Indian Association of Palliative Care, Tata Memorial Centre, February 10-12, 2007
5. Prof. Anjali Gera Roy "Rethinking Diaspora", University of Technology, Sydney 2006
6. Prof. Anjali Gera Roy "Nach Balliye : Bollywood Making a Song and Dance about Bhangra", Monash Universtiy, Melbourne, 2006
7. Prof. Anjali Gera Roy "Mahashweta Devi : Two Stories", India Semester, Fireflies Bangalore, 2007
8. Prof. Anjali Gera Roy "Bend it Like Beckham", McLuhan Centre, University of Toronto, 2007
9. Prof. Anjali Gera Roy "Commentary on The Other Side of Bollywood", McLuhan Centre, University of Toronto, 2007
10. Dr. Vijai Nath Giri "Gender and Communication", Institute of Media and Communication Science, Technical University, Ilmenau, Germany
11. Dr. Vijai Nath Giri "Theories of communication in developing relationships", Institute of Media and Communication Science, Technical University, Ilmenau, Germany
12. Dr. Saswat S. Das "End of the Grand Text : Towards a Commonwealth of text", Virginia Common wealth University, USA, March 6-12, 2007

## THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	Anamitra Basu	Lateral Advantage in the Perception of Visual Stimuli
2.	Bipasha Maity	Dynamics of Foodgrain Production and Sustainability in West Bengal: An Empirical Analysis
3.	Jaison A. Manjaly	Metaphysics of the Mental: Dualism and Beyond

4. Siddhartha Sankar Brahma      The Impact of Organizational and Human Resource Issues on Acquisition Performance
5. Soumendu Biswas      Organizational Culture and Psychological Climate as Predictors of Employee Performance and Organizational Effectiveness
6. Tanuka Roy      Illness Experiences: A Sociological Study of Adolescent Thalassaemics and Their Parent Caregivers

**BOOK PUBLISHED / CHAPTER IN EDITED BOOK**

#	Name of the Author(s)	Title	Publisher	Year
1.	Dr. B. Behera	Determinants of sustainable management of natural resource : The case of joint forest management (JFM) in India	Germany : Cuvillier Verlag, Göttingen	2006
2.	Dr. Chhanda Chakraborti	Logic : Informal, symbolic and inductive (2 <sup>nd</sup> Edition)	New Delhi : Prentice Hall	2007
3.	Prof. A. Gera Roy	Wole Soyinka : An anthology of recent criticism	Delhi : Pencraft	2006
4.	Prof. A. Gera Roy & Pillai, M. T.	Rohinton Mistry : An anthology of recent criticism	Delhi : Pencraft	2007
5.	Prof. A. Gera Roy & Bhatia, N.	Partitioned lives : Narratives of violence, displacement and resettlement	Delhi : Pearson Education	2007
6.	Dr. N. C. Nayak, Dr. K. Goswami Prof. B. Chatterjee (Eds.)	Economic reforms, human welfare and sustainable development in India	New Delhi : New Century Publications	2007
7.	Dr. P. Patnaik, S. A. Dhawalgi & Prof. M. K. Mandal	Training Manual on Defect Detection and Interrogation	Delhi : Defence Institute of Psychological Research, DRDO	2007
8.	Prof. M. B. Sharan & Prof. D. Suar (Eds.)	Psychology matters : Development, health and organization	New Delhi : Allied Publishers	2007
9.	R. C. Tripathi, A. Prakash & Prof. D. Suar et al. (Textbook development team)	Psychology : Textbook for class XII	New Delhi : NCERT	2007

#### ARTICLE / CHAPTER IN EDITED BOOK

1. Behera, B. Joint forest management (JFM) forests in Andhra Pradesh. In N.C. Nayak, K. Goswami, & B. Chatterjee (Eds.), *Economic reforms, human welfare and sustainable development in India* (pp. 207-221). New Delhi : New Century Publications, 2007
2. Biswas, S. & Srivastava, K.B.L. Organizational culture and human resource practices. In M. B. Sharan, & D. Suar (Eds.), *Psychology matters : Development, health and organization* (pp. 163-170), New Delhi : Allied Publishers, 2007
3. Dhar, S., Nayak, N. C., & Chatterjee, B. Hierarchical distribution of female education in India. In N.C. Nayak, K. Goswami, & B. Chatterjee (Eds.), *Economic reforms, human welfare and sustainable development in India* (pp. 107-127). New Delhi : New Century Publications, 2007
4. Gera Roy, A. *Adarsh Nagar diyaan Gallan* : At home in a resettlement colony. In M. Lal, & S. P. Kumar (Eds.), *Interpreting homes : South Asian literature* (16-33), Delhi : Pearson Education, 2006
5. Gera Roy, A. Secrets of good teaching : What professors have to do become world class. In V. Kirpal (Ed.), *It is all about Telling Stories* (pp. 146-55), Hyderabad : ICFAI Press, 2006
6. Gera Roy, A. Telling Africa in the manners of folk. In A. D. Drayton, O. Ajayi-Soyinka, & I. P. Ukpokodu (Eds.), *Chinua Achebe perspectives on African literatures at the millennium* (pp. 20-36), Trenton NJ : Africa World Press, 2006
7. Goswami, K. Silk trade and women in decision making. In N.C. Nayak, K. Goswami, & B. Chatterjee (Eds.), *Economic reforms, human welfare and sustainable development in India* (pp. 128-143). New Delhi : New Century Publications, 2007
8. Komalesha, H.S. History, colony, nation and nationalism. In J. Sarangi (Ed.) Raja Rao : The chess master and his moves (pp. 53-70), New Delhi : Authors Press, 2006
9. Komalesha, H.S. The God of small things : Sex, politics and identity of subversion. In B. Mishra (Ed.), *Critical responses to feminism* (pp. 127-135). New Delhi : Sarup & Sons, 2006
10. Mishra, T., & Chatterjee, B. Economic development and environmental degradation in India. In N.C. Nayak, K. Goswami, & B. Chatterjee (Eds.), *Economic reforms, human welfare and sustainable development in India* (pp. 263-272). New Delhi : New Century Publications, 2007
11. Misra, S., & Suar, D. Corporate social responsibility : From principles to practice. In M. B. Sharan & D. Suar (Eds.), *Psychology matters : Development, health and organization* (pp. 140-150). New Delhi : Allied Publishers, 2007
12. Nayak, N. C., & Samanta, D. Universal primary education in India : issues and challenges. In N.C. Nayak, K. Goswami, & B. Chatterjee (Eds.), *Economic reforms, human welfare and sustainable development in India* (pp. 86-106). New Delhi : New Century Publications, 2007
13. Pradhan, R.P., & Nayak, N.C. Infrastructure and modern farm practices in agriculture : A study of inter-regional disparities in Orissa. In Ch. P. K. Das, B. Behera, & F. C. Sahoo (Eds.), *Selected works on development and research in the post-reform era : Infrastructure special II* (pp. 18-42). Bhubaneswar : B C Publications, 2006
14. Srivastava, K. B. L. Competency mapping : Identifying and developing managerial competencies. In A. Kumar, M. R. Panda, Hariharan, & T. Ghosal (Eds.), *Organizational strategies and processes : Meeting challenges of growth* (pp 3-12), New Delhi : Viva Books, 2006

15. Suar, D., Sinha, H., & Hota, L. B. Natural resources, sustainable development and disadvantaged people. In N.C. Nayak, K. Goswami, & B. Chatterjee (Eds.), *Economic reforms, human welfare and sustainable development in India* (pp. 197-206), New Delhi : New Century Publications, 2007

#### **LAURELS & DISTINCTIONS**

1. Prof. A. Gera Roy                      Visiting Fellow, University of Technology at Sydney 2006
2. Prof. A. Gera Roy                      Indo-Canadian Shastri Fellowship 2007  
McLuhan Fellow 2007
3. Dr. V. N. Giri                              DAAD Fellowship 2007
4. Dr. S. Kapoor                              Charles Wallace India Trust Award 2007

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

1. Short Term Course on Small Industries Management Programme      March 27 – June 30, 2007
2. Short Term Course on German Language    December 18, 2006 –  
January 07, 2007
3. Short Term Course on German Language    July 09-29, 2007
4. QIP Short Term Course on Success in Soft Skills                                      February 01-06, 2007
5. Short Term Course on Inter-personal Effectiveness for the Faculty of NIT Jamshedpur, Jharkhand      July 09-14, 2006

## 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
Mahanty, B.	Ph.D., Operations Research, Information Systems, System Dynamics, Project Management
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 :**

Nandy, A.	Fellow of IIM, Calcutta, Networks Modeling, Simulation, Small World Networks
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#### **Visiting Faculty :**

Sarkar, C.	Ph.D., Asset Management, MIS
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## **FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION**

### **Faculty Appointment :**

Dr. M. K. Tiwari	Associate Professor
Dr. A. Nandy	Lecturer (Senior Scale)

### **Faculty Promotion :**

Dr. J. Maiti	Associate Professor
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## **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 :

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

### Consultancy Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Study on Ancillary Industry of PSCO India	POSRI, Rep. of Korea	26.00 Lakhs
2.	Strategic Options Study for Rural Roads under R D Department	Govt. of Orissa	
3.	Techno Economic Feasibility Study of Hindustan Cables Ltd., Calcutta	HCL, Kolkata	36.00 Lakhs
4.	Manpower Study at Mines Division of IMFA Ltd., Bhubaneswar	IMFA Ltd. Bhubaneswar	8.00 Lakhs
5.	Development of Educational Complex	Tirupati Asset	50.00 Lakhs
6.	Study on Ore Loss during Material Handling for OMC Operated Mines	OMC, Bhubneswar	7.50 Lakhs

#### **VISITS ABROAD BY FACULTY MEMBER**

1. Dr. M. Jenamani International Conference on Industrial Informatics, INDIN 2007, Vienna, Austria  
July 23-27, 2007
2. Dr. J. Maiti International Conference on Working on Safety, Zeewold, the Netherlands  
September 12–15, 2006)

#### **LECTURE BY VISITING EXPERT**

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

#### **THESES : DOCTORAL AND MS**

#	Name of Scholar	Title of Thesis
1.	Virupaxi Bagodi	Some Studies on the Growth of Two-wheeler Service Sector in India
2.	Ajodhya Nath Das	Some preventive Replacement Planning and Scheduling Models for Process Industries
3.	Ranjit Kumar Das	Design and Development of a Framework for Warranty Data Analysis
4.	Rajib Kumar Mohapatra	Optimization and Decision Support Models for Supply Chain Management of a Ferro Alloys Company
5.	Indrajit Mukherjee	Modelling and Optimization of Abrasive Metal Cutting Processes

#### **LAURELS & DISTINCTIONS**

1. Prof. P. K. Ray Fellow of World Academy Productivity Sciences

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

1. Six Sigma Fundamentals and Applications (SF) December 11-15, 2006
2. Total Quality Management in Service Organizations (MHRD) March 22-26, 2007
3. Training Programme on Materials Management for Probationary Officers of IR Stores Service (SF) June 11-July 6, 2007



## DEPARTMENT OF MATHEMATICS

**HEAD : Professor Syed Samsul Alam**

### **FACULTY**

#### **Professor :**

Alam, S. S.	M.Sc., Ph.D. (IIT, Kharagpur), Computer Science, Operations Research, Statistics
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), Computer Science, Operations Research
Gupta, U. C.	M.A., Ph.D. (IIT, Delhi), Statistics, Queuing Theory
Gupta, D. K.	M.Sc., DIIT, Ph.D. (IIT, Kharagpur), Computer Science and Numerical Analysis
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
Nanda, S. (on leave)	M.Sc., Ph.D. (Sambalpur), Functional Analysis, Fuzzy Mathematics, Optimization
Roy, A. R.	M.Sc., Ph.D. (IIT, Kharagpur), Relativistic Cosmology, General Theory of Relativity
Sarkar, A.	M.Sc., Ph.D. (IIT, Kharagpur), Statistics, Digital Image Processing, Satellite Image Analysis
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
Pandey, R. K.	M.Sc., Ph.D. (IIT, Kanpur), Singular Boundary Value Problems, Numerical Analysis, Ordinary Differential Equations
Raja Sekhar, G. P.	M.Sc., M.Phil., Ph.D. (Hyderabad), Fluid Mechanics, Algorithms

#### **Assistant Professor :**

Chakraborty, D.	M.Sc., Ph.D. (IIT, Kharagpur), Information Systems, Operations Research, Fuzzy Logic and Reasoning
Gayen, R.	M.Sc, Ph.D. (Calcutta), Fluid Dynamics, Integral Equations
Ghosal, K.	M.Sc, Ph.D. (Jadavpur), Sediment Transport in Turbulent Flow

Gnaneshwar, N.	M.Sc, Ph.D. (IIT, Bombay), Numerical Functional Analysis, Ill-posed problems
Maity, S.	Ph.D. (ISI, Calcutta), Combinatorics, Cryptography, Fault-Tolerance, VLSI, Architectures, Statistical Designs of Experiments
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), Optimization Technique
Panigrahi, P.	M.Sc., Ph.D. (ISI, Bangalore), Graph Theory , Combinatorics

**Visiting Faculty :**

Biswas, D.	M.Sc., Ph.D. (Leeds, UK), Clifford Analysis, Functional Analysis
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**Emeritus Professor :**

Gupta, A. S.	M.Sc., Ph.D., D.Sc., (Kharagpur), FNA, FNASc., Fluid Mechanics, Magnetohydrodynamics, Stability of Fluid Flows, Heat and Mass Transfer of Fluid Flows
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**FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION**

**Faculty Appointment :**

Dr. N. Gnaneshwar	Assistant Professor
Dr. Soumen Maity	Assistant Professor
Dr. Koeli Ghoshal	Assistant Professor
Dr. Rupanwita Gayen	Assistant Professor
Dr. D. Biswas	Visiting Faculty

**Faculty Appointed as Emeritus Professor :**

Prof. A. S. Gupta	Emeritus Professor
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**Faculty Promotion :**

Prof. Somesh Kumar	Professor
Prof. A. Goswami	Professor
Dr. G. P. Raja Sekhar	Associate Professor
Dr. R. K. Pandey	Associate Professor
Dr. P. V. S. N. Murthy	Associate Professor
Dr. Pawan Kumar	Associate Professor

## RESEARCH AND DEVELOPMENT

### Thrust Areas :

1. Applied mathematics,
2. Pure Mathematics,
3. Statistics,
4. Theoretical Computer Science

## ON-GOING RESEARCH PROJECTS

### Sponsored Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Classification of Hyperspectral remote sensing data to discriminate between crop condition variety and stage	ISRO	7.48 Lakhs
2.	FIST program Department of Mathematics	DST New Delhi	22.00 Lakhs
3.	Unsteady Flow Separation Using Particle Simulation Approach	DST	6.50 Lakhs
4.	Vortex Shading and Heat Transfer From Bluff Body With Ground Effect	CSIR	5.50 Lakhs
5.	Wall Proximity on Bluff Body Wake	CSIR	10.00 Lakhs
6.	Development and Implementation of extended finite element method (X-FEM) for modeling cohesive discontinuities in rock mass	DST	16.34 Lakhs
7.	Numerical Investigation of Convective Transport in a non-Darcy Porous Media with focus on Second Order Effects	CSIR	7.50 Lakhs
8.	Nonlinear Singular Boundary Value Problems Arising in Physiology	CSIR	5.66 Lakhs
9.	Integration of Fuzziness and Randomness with Special Emphasis to Re-modelling of Inventory Problems	DST	5.31 Lakhs
10.	A Genetic Algorithm Approach to Solve Generalized Non-Linear Optimization Models with Hybrid Data	MHRD, New Delhi	5.00 Lakhs
11.	Linguistic Information Processing for Decision Making in An Evaluation Programme	IIT, Kharagpur	1.0 Lakhs
12.	Processing of Experts? Linguistic Opinion in an? Evaluation process? Object-oriented decision modeling in multicriteria-multiexpert framework	CSIR	5.00 Lakhs
13.	Wavelet Methods for the Eigenvalues Problems for Integral Operators	DST	3.00 Lakhs

### VISITS ABROAD BY FACULTY MEMBER

1. Prof. U. C. Gupta Research Collaboration (Royal Military College, Kingston, Canada)
2. Prof. S. Bhattacharyya Research Collaboration on Hydrodynamics of nanoparticle aggregates, Max Planck Institute, Bremen, Germany
3. Dr. G. P. Rajasekhar Pohang University of Science and Technology, South Korea, BK21 Intensive lecture supported by BK21 Continuous and Discrete Math, Research Organization
4. Dr. G. P. Rajasekhar Visiting Academic Staff on Research Collaboration on Fluid Mechanics of Reproductive Systems, The University of Birmingham, UK
5. Dr. P. V. S. N. Murthy Research collaboration, Department of Mechanical Engineering, Hong Kong University, Hong Kong, 15<sup>th</sup> May – 30<sup>th</sup> June 2007.
6. Dr. S. Maity Research Collaboration on Cryptography, Paris, France, June 2007.

### INVITED LECTURES BY FACULTY MEMBERS

1. Prof. S. Bhattacharyya Lattice Boltzman Simulation of the Hydrodynamics of fractal aggregates at Institute Techno-und Wirtschaftsmathematik, Kaiserslautern
2. Prof. S. Bhattacharyya Control of Bluff Body Vortex shedding at University of Stuttgart, Germany
3. Dr. Somesh Kumar Delivered invited lectures in the "Workshop on Multivariate Statistical Methods" organized by Indian Statistical Institute, Kolkata, December 23-27, 2006
4. Dr. Somesh Kumar Organized an invited session on Ranking and Selection Procedures & delivered a lecture in International Conference on Multivariate Statistical Methods in the 21st Century, The Legacy of Prof. S.N. Roy, Indian Statistical Institute, Kolkata, Dec 28-29, 2006
5. Dr. P. V. S. N. Murthy Lecture on "Second order effects in porous media" at the National conference on Mathematics organized jointly by the Department of Mathematics, Sindh Mahavidyalaya and Regional Remote Sensing and Service Center, Nagpur, March 8-9, 2007

### THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	Yogesh Mani Tripathi	Estimation in Restricted Parameter Spaces
2.	Gour Chandra Mahata	Mathematical Modelling in Inventory Replenishment Policies Under Fuzzy Environment
3.	R. Bala Venkata Subramanyam	Some Aspects of Fuzzy Data Mining Techniques For Quantitative Databases
4.	Chandan Chakraborty	Linguistic Information Processing In Decision Making

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|----|-----------------------|---|
| 5. | Abhijit Datta Banik   | Analysis of Vacation and Non-vacation Queues under Markovian Arrival/ Service Process     |
| 6. | Debdas Mishra         | Graceful Lobsters Obtained by Applying Component Moving and Joining Techniques            |
| 7. | Subarna Bhattacharjee | Study of System Failure by Probabilty and Possibility Distributions                       |
| 8. | Motilal Panigrahi     | Some Contributions of Fuzzy Set Theory and Its Applications                               |
| 9. | Pankaj Dutta          | Redefining Some Inventory Management Problems in Imprecise and / or Uncertain Environment |

#### BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	A. K. Sharma, Prof. A. Goswami, D. K. Gupta	Fuzzy inclusion dependencies in fuzzy databases	IGI Publishers	2007
2.	S. P. Pal, Prof. Somesh Kumar	Quantum Information, Computation and Communication	Allied Publishers Pvt. Ltd, New Delhi	2006
3.	P. Datta, Dr. D. Chakraborty, Prof. A. R. Roy	Fuzzy Logic and Its Applications in Technology and Management	Narosa Publisher	2007
4.	Dr. Debjani Chakraborty, Prof. S. Nanda, D. Dutta Majumder	Fuzzy Logic and Its Application in Technology and Management	Narosa	2007
5.	Dr. Debapriya Biswas	A chapter "An Outline of Water Resources and Scope of its ppropriate Management for Sustenance" in "Water Harvesting and Water Utilisation"	North-East India (Ed. Book), by Assam (Central, University, Silchar, India.	2007
6.	Dr. G. Panda	A Chapter "A Miltistage Allocation Process in inventory control programming, Fuzzy Logic and Optimization, pp. 62-77.	Narosa	2006

#### LAURELS & DISTINCTIONS

- |    |                    |   |
|----|--------------------|---|
| 1. | Prof. Somesh Kumar | Executive Editor of Bulletin of Statistics and Economics since February 2007              |
| 2. | Prof. Somesh Kumar | Editor of the International Journal of Applied Mathematics and Statistics since June 2005 |

3. Prof. Somesh Kumar Executive Editor of the International Journal of Ecological Economics and Statistics since June 2005
4. Prof. Somesh Kumar Referee for several national and international journals such as J. of Statistical Computation and Simulation, Journal of Applied Mathematics and Computing, J. of Multivariate Analysis, J. Statistical Planning and Inference, Naval Research Logistics, Communications in Statistics-Theory and Methods, Indian J. Mathematics etc.

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

1. Workshop on Statistical Applications in Defence Research February 24, 2007  
(Prof. Somesh Kumar)

## DEPARTMENT OF MECHANICAL ENGINEERING

**HEAD : Professor Sankar Kumar Som**

### **FACULTY**

#### **Professor :**

Bhattacharyya, Ranjan	Ph.D. (Kentucky), Applied Mechanics
Bhattacharyya, Sati Nath	Ph.D. (IIT Kharagpur), Fluid Mechanics
Bhattacharyya, Souvik	Ph.D. (Texas A&M), Thermal Science & Engineering
Brahma, Ranajit Kumar	Ph.D. (IIT Kharagpur), Thermal Science & Engineering
Chattopadhyay, Ajay Kumar	Ph.D. (Jadavpur Univ), Production Engineering
Das, Prasanta Kumar	Ph.D. (IIT Kharagpur), Heat Transfer, Fluid Flow
Dash, Sukanta Kumar	Ph.D. (IIT Kharagpur), Thermodynamics, Fluid Mechanics, CFD, Heat Transfer
Karmakar, Ranjit	Ph.D. (IIT Kharagpur), Applied Mechanics
Maiti, Biswajit	Ph.D.(IIT Delhi), Fluid Machinery, Two-phase Flow, FEM
Maiti, Rathindranath	Ph.D. (IIT Kharagpur), Machine Design, Material Handling Equipment Design
Mishra, Prasanta Kumar	Ph.D. (Jadavpur Univ), Non-conventional Manufacturing
Mohanty, Amiya Ranjan	Ph.D. (Kentucky), Applied Mechanics
Mukherjee, Amalendu	Ph.D. (IIT Kharagpur), System Dynamics and Control
Paul, Soumitra	Ph.D. (IIT Kharagpur), Machining and Grinding, Surface Coating Technology
Pradhan, Brajabandhu	Ph.D. (IIT Kharagpur), Machine Design, FEM
Roy Chowdhury, Samar Kumar	Ph.D. (Birmingham), Tribology, Wear
Satyamurty, V. V.	Ph.D. (IIT Kanpur), Thermal Sciences, Solar Energy
Sekhar, A Seshadri	Ph.D. (IIT Madras), Rotor Dynamics
Som, Sankar Kumar	Ph.D. (IIT Kharagpur), Thermal Science and Engineering

#### **Associate Professor :**

Biswas, Kajal	Ph.D. (IIT Kharagpur), Manufacturing Science and Engineering
Chakraborty, Suman	Ph.D. (IISc Bangalore), CFD, Heat Transfer and Fluid Flow, Nano-Fluidics
Dasgupta, Anirvan	Ph.D. (Kanpur), Mechanics, Dynamics and Control
Ghosh Moulic, Sandipan	Ph.D. (Arizona), Thermal Engineering
Kumar, Cheruvu Siva	Ph.D. (IIT Kharagpur), Robotics, Controls, Networks
Pratihari, Dilip Kumar	Ph.D. (IIT Kanpur), Soft Computing

Ramgopal, Maddali	Ph.D. (IIT Madras), Refrigeration and air conditioning
Roy, Subhransu	Ph.D. (Penn. State), Heat Transfer
Ray, Kumar	Ph.D. (IIT Kharagpur), Machine Dynamics
Ray, Manas Chandra	Ph.D. (IIT Kharagpur), Applied Mechanics, Smart Structures
Roy Chowdhury, Asimava	Ph.D. (IIT Kharagpur), Manufacturing Science, Rapid Prototyping, Laser processing

**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
Dutt, Jayanta Kumar	Ph.D. (IIT Delhi), Rotor Dynamics
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. (Case Western), IC Engines
Saha, Partha	Ph.D. (IIT Kharagpur), Laser Processing
Samantaray, Arun Kumar	Ph.D. (IIT Kharagpur), System Dynamics and Control
Sarangi, Mihir	Ph.D. (IIT Kharagpur), Tribology, Rotor Dynamics

**Visiting Faculty :**

Nath, A. K.	Ph.D. (Bombay Univ), Manufacturing Sc. and Engineering
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**Emeritus Professor :**

Chattopadhyay, Asit Baran	Ph.D. (Jadavpur Univ), Metal Cutting
Datta, Gouranga Lal	Ph.D. (IIT Kharagpur), Welding and Foundry Tech., Quality Assurance and Reliability

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

**Faculty Appointment :**

Dr. Partha Saha	Assistant Professor
Dr. Mihir Sarangi	Assistant Professor

**Faculty Appointed as Emeritus Professor :**

Prof. Asit Baran Chattopadhyay	Emeritus Professor
Prof. Gouranga Lal Datta	Emeritus Professor



**Faculty Promotion :**

Prof. Biswajit Maiti	Professor
Prof. Soumitra Paul	Professor
Dr. Suman Chakraborty	Associate Professor
Dr. Kumar Ray	Associate Professor
Dr. Manas Chandra Ray	Associate Professor
Dr. Asimava Roy Chowdhury	Associate Professor

**Faculty Retirement :**

Prof. Bankim Chandra Majumdar	Professor
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**Faculty Resignation :**

Prof. Prasant Kumar Mishra	Professor
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**RESEARCH AND DEVELOPMENT****Brief descriptions of on-going activities :**

1. Design and development of expert systems in robotics, manufacturing science, medical diagnosis and others using soft computing
2. Bio-micro-fluidics and micro scale transport processes
3. Laser materials Processing
4. CFD/Lattice Boltzmann Method in Complex Flows
5. Study of the Mullins Effect in rubber-like, hyper-elastic materials
6. Lateral dynamics of a rail-vehicle system
7. Dynamics of lubricated ball bearings
8. Numerical simulation on two phase flow pertaining to bottom injected gas stirred ladles
9. High Efficiency Deep Grinding Modeling & Experimentation
10. High Pressure Cooling in Machining of Super Alloys
11. TiN hard coating by unbalanced magnetron using Physical Vapor Deposition Technique
12. Multi Layer TiN-MoS<sub>2</sub> coating on cutting tools by unbalanced magnetron technique
13. Machinability study of Inconel 718
14. Development of control strategies for autonomous underwater vehicles
15. Modeling and simulation of through-process hot steel rolling using bond graph
16. Model based fault detection and isolation
17. Development of liquid spring technology
18. Soft computing techniques used in conventional and non-conventional machining
19. Simulation of liquid sloshing in a tank using numerical grid generation techniques
20. Prediction of fluid flow and heat transfer from wavy surfaces
21. Design and development of carbon dioxide based heat pump systems

**Thrust Areas :**

1. Analytical & Computational Fluid Dynamics
2. Bio-Mechanics
3. Combustion
4. Composite Materials and Smart Structure
5. Condition Monitoring and Diagnostics
6. Eco-Friendly Refrigeration
7. Fluid Drives and Control

8. High Speed Machining, Grinding and Development of Cutting Tools / Grinding Wheel
9. Laser Processing of Materials
10. Micro Manufacturing and Micro-scale Transport Processes
11. Modeling & Simulation of Mech. Systems
12. Multiphase Flows and Heat Transfer
13. Nonlinear Dynamics
14. Rapid Prototyping
15. Tribological Design of Machineries
16. Automation and control
17. Online fault detection and isolation
18. Fault tolerant control
19. Soft computing and Expert systems
20. Nonlinear Elasticity
21. Rotor Dynamics
22. Coating of cutting tools and environment-friendly high efficiency machining
23. Bio-micro-fluidics and micro-scale transport processes
24. CFD/Lattice Boltzmann Method in Complex Flows

#### **New Acquisitions :**

1. 100Mbps WAN Link has been established for the national GARUDA Grid computing network for sharing super computing resources at Pune and Bangalore.
2. A high quality video conferencing facility capable of handling up to 6 simultaneous users on an IP net has been installed for the national QoS network at the department.
3. AC/DC Current sensor
4. 1D AirTrack
5. B&K Vibration meter

#### **ON-GOING RESEARCH PROJECTS**

##### **Sponsored Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Active Structural-Acoustic Control of Smart Structures using 1-3 Piezoelectric Composite Material	DST	16.40 Lakhs
2.	Design, Development and Performance Study of New Concept Harmonic Drive	DST	10.16 Lakhs
3.	Application of Genetic Algorithm for Minimization of Machining time and CL data file size in CNC machining of free form surfaces	MHRD	7.00 Lakhs
4.	Development of Software for the Direct Slicing of CAD models	DST	2.84 Lakhs
5.	Flow and Heat Transfer Modeling in a Thrust Chamber of a Rocket Engine	ISRO, Bangalore	8.00 Lakhs
6.	EHD enhancement of natural convection heat transfer	CSIR	10.00 Lakhs
7.	CO <sub>2</sub> based industrial heat pumps: prototype design and development	MHRD	9.00 Lakhs
8.	Development and characterization of novel nano-crystalline metallic/ceramic based hydrogen sensor materials	MHRD	15.00 Lakhs

9.	Design fabrication and characterization of micro-structured surface for boiling heat transfer	MHRD	9.00 Lakhs
10.	Visualization and Optical Diagnosis of Two-Phase Flow: Bubbles and Droplet Distribution and Dynamics Pertaining to Carry-Over Phenomena	BARC	39.00 Lakhs
11.	Transient Boiling and Counter Current Flow Phenomena during Direct in Bundle Emergency Coolant Injection	BARC	42.00 Lakhs
12.	Modeling and Simulation of Momentum, Heat and Mass Transfer in Laser Surface Alloying	DST	9.72 Lakhs
13.	Modeling and Simulation of photo-thermal interaction of laser beam with living biological tissues	DST	4.32 Lakhs
14.	Micro-fluidics and Micro-scale Transport Processes	SRIC	6.00 Lakhs
15.	Development of an advanced micro manufacturing technology characterized by micro surface quality control of Bio-MEMS device	DST/JSPS	2.84 Lakhs
16.	Cell Culture inside Micro-fluidic Channels with Extended Air-water Interface	DBT	17.40 Lakhs
17.	A Study of Micro-scale Transport Processes Leading to the Development of a Cooling Strategy For Electronic Components	DIT	89.75 Lakhs
18.	Experimental and Theoretical Studies on DNA Hybridization in Micro-channels with Electro-kinetically Driven flow	DST	4.38 Lakhs
19.	Development of window based interactive software with user friendly GUI for numerical simulation of laser surface treatment of materials	DAE (BRNS)	9.32 Lakhs
20.	Indo-US Project on Futuristic Manufacturing	Indo-US forum	0.00 Lakhs
21.	IRES: U.S.-India Fast DNA Hybridization in Micro-fluidic Platforms	NSF	0.00 Lakhs
22.	Sputter coating of Mos2 based composite on cutting tool	MHRD	12.00 Lakhs
23.	Experimental study of machinability and optimization of machining condition for Inconel 718	DST	7.34 Lakhs
24.	Development of advanced coating for cutting tools and development of advanced high speed grinding technology	DST-FIST programme	148.75 Lakhs
25.	Multi-sensor based tool condition monitoring in drilling	CSIR	7.56 Lakhs
26.	Surface integrity in high efficiency grinding by super-abrasive wheels	MHRD	25.00 Lakhs
27.	Water lubricated transport of heavy oils – experimentation and theory	DST	19.00 Lakhs

28.	Development and Characterization of nano-fluid for micro thermal heat transfer application in Advance satellites	ISRO	4.33 Lakhs
29.	Development of Instrumentation for Liquid liquid and gas Liquid systems	MHRD	14.00 Lakhs
30.	Biomechanical Analysis and Design of Orthopedic Implant	DBT, Govt. of India	51.12 Lakhs
31.	National Grid Computing Project – GARUDA	IIT Kharagpur, CDAC and ERNET India	0.00 Lakhs
32.	Establishment of Nationwide QoS Test-bed network	MIT	126.00 Lakhs
33.	Development of Autonomous Underwater Vehicle	DOD	697.00 Lakhs
34.	Synthesis and Characterization of in-situ carbide reinforced austenitic manganese steel matrix composites	Naval Research Board	28.00 Lakhs
35.	Through Process Modeling and Simulation of Hot Rolling using Bond Graph	DST	4.68 Lakhs
36.	Drill wear monitoring using soft-computing techniques	IIT Kharagpur	3.00 Lakhs
37.	Advanced Machining & Grinding (Manufacturing)	DST-FIST	198.00 Lakhs
38.	Design and development of adaptive robot controller using soft computing	DST	8.38 Lakhs
39.	Establishment for an advanced research facility for EB welding and process development related to programs of interest to DAE	BRNS, DAE	42.53 Lakhs
40.	Compressor driven metal hydride cooling and heating systems	MNES	19.50 Lakhs
41.	Studies on Application of Phase Change Materials in Domestic Frost-free refrigerators	IIT, Kharagpur	0.50 Lakhs
42.	Compression-Absorption systems for cooling and heating applications	ERD, CSIR	7.35 Lakhs
43.	Carbon dioxide based heat pump systems for simultaneous cooling and heating applications	MHRD	7.00 Lakhs
44.	Removal of Obsolesce and Modernization of Refrigeration and Air Conditioning Laboratory	MHRD	20.00 Lakhs
45.	Composite Applications Laboratory	TIFAC, DST	346.20 Lakhs
46.	Online component fault detection and isolation using diagnostic bond graphs	IIT Kharagpur	3.00 Lakhs
47.	Electro-hydrodynamic enhancement of heat transfer in free convection	CSIR	0.00 Lakhs
48.	Optimization of CNC Machining of Free Form Surfaces	AICTE	5.00 Lakhs
49.	Study of Direct Selective Laser sintering of Powder metals	DST	13.70 Lakhs

50.	An investigation of thermally sprayed cermet coatings for hard chrome replacement	IIT Kharagpur	5.00 Lakhs
51.	Indo-South African Project	DST (India) & NRF (South Africa)	3.50 Lakhs

**Consultancy Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Development of Liquid-Spring Shock Isolation Technology	DRDO	10.00 Lakhs
2.	An Integrated Micro-Macro Solidification Algorithm for Direct Numerical Simulation of Large Scale Solidification Structures	General Motors, USA	23.58 Lakhs
3.	Development of a fundamental model for characterizing solidification transport in the mushy region	General Motors, USA	38.78 Lakhs
4.	Characterization of surface roughness for pressure driven and/or electro-osmotic liquid flow in a micro-channel	DELPHI	7.63 Lakhs
5.	Genetic Algorithms in hydro-cyclones	TATA Steel	0.00 Lakhs
6.	Manual for Cooling Tower water treatment	M.M. Aqua Technologies	1.25 Lakhs
7.	Numerical Modeling of flow and mixing in a Tundish	Tata Steel	5.00 Lakhs
8.	Aerodynamic simulation study of P15A	Mazagon Dock Ltd.	24.50 Lakhs
9.	Mathematical Modeling of coaxial lance for fuel Injection	Tata Steel	4.50 Lakhs
10.	Software development for surface wave in a slab caster mold	Tata Steel	5.80 Lakhs
11.	CFD analysis of Seachest	GRSE Ltd.	8.20 Lakhs
12.	Flow simulation in Tundish	IFGL Refractories Ltd.	1.12 Lakhs
13.	Stress analysis of steel cord reinforced pipe conveyor belt(SCPC)	Phoenix Yule Limited, Kolkata	2.24 Lakhs
14.	Design, Development and Performance Study of a New Concept Harmonic Drive	DST	10.00 Lakhs
15.	Plant Noise Control	Tata Metaliks Ltd., Kharagpur	4.50 Lakhs
16.	Design and Stress Analysis of Cooling Tower Fan	Paharpur Cooling Towers Limited	2.30 Lakhs
17.	Overall Noise and Vibration Reduction in Farm Tractors	Escorts Limited, Faridabad	6.50 Lakhs
18.	Survey of Cement Mill Crack	Ambuja Cement	0.10 Lakhs
19.	Design and Development of mathematical model for ultra-fast cooling of steel strips	Tata Steel	5.61 Lakhs

20.	Air conditioning system of Netaji Indoor Stadium, Kolkata	PWD, Government of West Bengal	0.80 Lakhs
21.	Development of web and video courses on Refrigeration & Air Conditioning	MHRD, NPTEL	0.00 Lakhs
22.	Technology Transfer- A Knee Joint Simulator	M/s. N. K. Instruments, Kolkata	0.00 Lakhs
23.	Experimental sample preparations by wire cut EDM (CEDM)	Various clients	0.87 Lakhs
24.	Material Processing by Nd-YAG laser (MPNL)	Various clients	0.86 Lakhs

#### **VISITS ABROAD BY FACULTY MEMBER**

1.	Dr. P. P. Bandyopadhyay	Switzerland, Research on Coating Technology
2.	Dr. S. Chakraborty	Germany, Alexander von Humboldt Fellowship
3.	Dr. S. Chakraborty	Japan, DST-JSPS Project
4.	Dr. S. Chakraborty	USA, Indo-USA Project
5.	Prof. P. K. Das	Switzerland, Bilateral Cooperation
6.	Dr. S. Gupta	U.K., Formulation of UKIERI project
7.	Prof. A. R. Mohanty	Australia, International Congress
8.	Dr. S. K. Pal	South Africa, Indo-South African Project
9.	Dr. M. C. Ray	USA, Collaborative Research
10.	Prof. V. V. Satyamurty	USA, International Conference
11.	Prof. S. K. Som	Sweden, Visiting Professor

#### **LECTURE BY VISITING EXPERT**

1.	Dr. Nilanjan Chakraborty, University of Liverpool, UK	Importance of displacement speed statistics in turbulent premixed flame modeling.
2.	Dr. Shantanu Bhattacharyya, University of Missouri, USA	A novel PCR based DNA micro-analyzer
3.	Prof. P. Stephen Heynes, University of Pretoria, South Africa.	(i) Drill wear monitoring based on angular speed (ii) Vibration based tool condition monitoring
4.	Prof. Anindya Chatterjee, IISc, Bangalore	Studies on some non-linear delay differential equations

#### **INVITED LECTURES BY FACULTY MEMBERS**

1.	Dr. S. Chakraborty	Towards an Improved Understanding of Surface Effects in Microscale Liquid Flows at MIT, USA; UC Berkeley, USA.
2.	Dr. S. Chakraborty	Novel Mechanisms for Rapid DNA Hybridization through Microfluidics at Northwestern University, USA.

3. Dr. S. Chakraborty Effects of Micromanufacturing Process Parameters on Fluid Flow in Microchannels at University of Tokyo, Japan
4. Dr. S. Chakraborty Effects of Micromilling Process Parameters on Fluid Flow in Microchannels at IIT Kanpur.
5. Prof. A. K. Chattopadhyay Cutting tool materials and tool life at National Institute of Technical Teachers' Training and Research, Kolkata.
6. Prof. A. B. Chattopadhyay Application of control systems in machine tools in machining at UCE-Burla.
7. Prof. A. B. Chattopadhyay On-line tool condition monitoring at CSIT, Karnataka.
8. Prof. A. B. Chattopadhyay Advanced machining and grinding technology at Kalayani Govt. Engg. College.
9. Prof. P. K. Das Session Chair at International Conference on Multiphase Flow (ICMF07), Leipzig, Germany (Session Chair, Paper presentation) Participants: 700.
10. Prof. P. K. Das Workshop on MEMS and Microsystems, Space Technology Cell IIT Kharagpur
11. Prof. P. K. Das Development of Unique Sensors and Appropriate Signal Processing Techniques for Multiphase Flow at LSTM, EPFL, Switzerland.
12. Dr. S. Gupta Biomechanical Analysis of Orthopaedic Implants at Central Mechanical Engineering Research Institute, Durgapur.
13. Prof. P. K. Mishra G C Sen Memorial Lecture- A vision towards manufacturing for the future at BIT Mesra, 21st National Convention of the Production Engineers (IEI).
14. Prof. P. K. Mishra Key Note: Design for Miniaturization with Case Studies at COEP, Pune (Int. Conf. on Advances on Machine Design and Industrial Automation).
15. Prof. P. K. Mishra S K Sorkel Memorial Lecture: A Vision for Futuristic Micromanufacturing at Jadavpur University.
16. Prof. A. R. Mohanty Motor Current Signature Analysis at Crompton Greaves, Mumbai.
17. Prof. A. R. Mohanty Environmental Noise Pollution at Ambuja Cement, Sankrail.
18. Prof. A. R. Mohanty Motor Current Signature Analysis at CMERI, Durgapur.
19. Prof. A. R. Mohanty Signal Processing in Machinery Health Monitoring at NML, Jamshedpur.
20. Prof. A. R. Mohanty Machinery Condition Monitoring at INS Shivaji, Lonavala.
21. Dr. M. Ramgopal Non-Conventional Refrigeration Systems at CMERI, Durgapur.
22. Dr. M. Ramgopal Energy Conversion Systems Based on Metal Hydrides at Jadavpur University, Kolkata.

## THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	Jahar Sarkar	Trancritical Carbon Dioxide Heat Pumps for Simultaneous Cooling & Heating.
2.	Saroj Kr. Sarangi	On Nucleation and Growth of HFCVD Diamond Coating on Carbide Inserts and Its Performance in Machining.
3.	Subrata Kumar	Development of Heat Transfer Model for Parametric Studies on Laser Deposition of Metals with Powder Feed.
4.	Chinmaya Kar	Torsional Vibration Model and Motor Current Signal Based Fault Detection Technique for Multi-stage Helical Gearbox.
5.	Prasanta Kr. Satapathy	Studies on Compression-absorption Systems for Heating and Cooling applications .
6.	Sudipto Ray	Temperature rise at the contact between sliding surfaces with micro and nano scale roughness :Experiments and analysis.
7.	Sanjoy Kr. Ghosal	Model-based Fault Diagnosis and Accommodation using Analytical Redundancy : A Bond Graph Approach.
8.	D. V. Patil	Grindability Study of Inconel 718 Using Galvanically Bonded Monolayer cBN Wheel.
9.	Birajashis Pattnaik	Studies on Multivariate Process Capability Indices Using Robust PCA and Computational Geometry.
10.	Vommi Vijaya Babu	Economic Design of X Control Charts with Uncertainty in Cost and Process Parameters Using A Risk Minimization Approach.
11.	Ram Naresh Rai	Some Studies on Synthesis and Characterisation of In-situ Al-TiC Metal Matrix Composites.
12.	Achinta Kr. Pramanick	Natural Philosophy of Thermodynamic Optimization.
13.	R. Prasantha Kumar	Dynamics, Control, and Optimal Motion Planning of Autonomous Underwater Vehicles.
14.	Arup Kumar Das	Studies on nucleate Boiling and Bubbling process-through submerged orifices.
15.	Sumit Basu	A simple Dynamically adaptive approach of Interface reconstruction following the fixed-grain Enthalpy-porosity formulation for Solid-Liquid phase transformation Modeling.
16.	Debabrata Dasgupta	Homogenization of diffusion coefficient for effective-Multi-Scale Modeling of Diffusion Dominated phase-change process.
17.	Angshuman Chattopadhyay	Some Studies on Stresses in Thin Rimmed Gear-with Specific reference to its application in harmonic drivers
18.	Saumya Sankar Adhikari	Study and Improvement of Machinability Characteristics of Inconel 718.



## BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	Dr. S. Chakraborty	Fundamental Concepts in Engineering Mechanics	Everest Publishing House	2007
2.	Dr. D. K. Pratihar and N. B. Hui	Chapter in : Studies in Computational Intelligence	Springer-Verlag	2007

## PATENTS GRANTED

1.	Prof. R. Maiti	A Torque Amplifier using Alternating Flow Hydraulics and Epitrochoid Generated Rotary Piston Hydraulic Motor
2.	Prof. P. K. Mishra	A voltage and current measurement system for sparks
3.	Prof. P. K. Mishra	A selective fused deposition modeling machine using electrochemical discharge
4.	Dr. A. Roy Chowdhury	CNC software package for milling of 2-D contours
5.	Dr. A. Roy Chowdhury	A Portable Infusion Pump
6.	Prof. S. K. Roy Chowdhury	A Knee Joint Simulator
7.	Dr. S. Roy	Development of low feed rate powder feeder for laser assisted deposition of metal powders

## LAURELS & DISTINCTIONS

1.	Dr. S. Chakraborty	Alexander von Humboldt Fellowship, 2006
2.	Prof. P. K. Mishra	Achievement Award, by the Production Engineering Division of Institution of Engineers, India, 2007
3.	Prof. S. Paul	Associate Editor, International Journal of Abrasive Technology
4.	Dr. A. Roy Chowdhury	Commonwealth Academic Staff Fellowship award
5.	Prof. S. K. Som	Fellowship of National Academy of Sciences, 2006

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

1.	IWMNST, 2006, IIT Khragpur Kolkata Campus	
2.	Programme for HAL Engineer Trainee (QIP)	Two Semesters
3.	Hydro Plant Operations for Hindustan Zinc Limited (QIP)	January 4-18, 2007
4.	Round Table Discussion on Power Beam Welding, IIT Kharagpur Kolkata Extension Centre	
5.	Advanced structural analysis (QIP)	October 9-13, 2006
6.	Automotive NVH, Mahindra & Mahindra, Nashik	

## 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, USA), Materials Processing, Applications of Genetic Algorithms
Das, Siddhartha	Ph.D. (University of Illinois, USA), Mechanical and Physical Metallurgy, Nano Materials, Electron Microscopy, Composite Materials, Surface Engineering
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 casting, Composites, Energy cons.
Ray, Kalyan Kumar	Ph.D. (IIT Bombay), Physical Metallurgy, Stereology, Fracture Mechanics, Nondestructive Evaluation, Structural Integrity, Failure Analysis, Advanced Structural Materials, Modeling and Simulation
Roy, Sanat Kumar	Ph.D. (IIT Kharagpur), Process Metallurgy, Thermodynamics and Kinetics, Environmental Degradation of Materials, Laser Surface Engineering

#### **Associate Professor :**

Acharya, Narendra Nath	Ph.D. (IIT Kharagpur), Particulate Tech. Multimedia, (metals, non-metal), Modelling (ANN & GA)
Majumdar, Jyotsna Dutta	Ph.D. (IIT Kharagpur), 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
Biswas, Koushik	Ph.D. (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 Tech., Sweden), Hydrometallurgy and electrometallurgy, Atomistic simulation, Wet chemistry based material synthesis

**Visiting Faculty :**

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

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

Basu Samar TATA-Chair Professor	Ph.D. (IIT Kanpur), Electrochemistry, Extractive Metallurgy, Rechargeable Battery Technology
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**FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION****Faculty Appointment :**

Dr. Tarun Kumar Kundu	Assistant Professor
Dr. Koushik Biswas	Assistant Professor

**Faculty Promotion :**

Dr. Shiv Brat Singh	Associate Professor
Dr. Jyotsna Dutta Majumdar	Associate Professor

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

Prof. Brij Kumar Dhindaw	Professor
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**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. 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 15 B. Techs, 5 Dual Degree M. Techs, 26 M. Techs, 4 MS, 21 PGDST and 10 PhDs, and initiated/continued 9 consultancy and 43 sponsored/collaborative projects during the academic year 2006-2007. The Department is proud to have published **116** research papers in national and international journals and presented **59** conference papers during 2006-07 academic year.

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 characterisation 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 **Modeling, Simulation and Multimedia** have eventually emerged as one of the current thrust areas of research activities of the department. In addition to mathematical modeling works in the areas like surface engineering, phase transformation, solidification processing, fracture & fatigue, some more new areas have surfaced and these are i) application of genetic algorithm for the optimization metallurgical systems, ii) mathematical simulation of high temperature metallurgical systems by application of computational fluid dynamics, heat and mass transfer, iii) molecular dynamic simulation of nanostructured materials. The department has also developed a full-fledged multimedia laboratory, which is presently engaged in developing interactive compact discs (CDs) for teaching and learning in the field of Metallurgy. Investigations on the fundamentals of solid-state and liquid-solid phase transformation continue to receive the most prominent attention from the Physical Metallurgy group of the department.

The major thrust in the area of **Physical Metallurgy**, and in particular, concerning phase transformation activities lies in the area of synthesis and structural characterization of nanocrystalline materials prepared by planetary ball milling. Some 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. Catalytic characteristics of nanostructured nickel aluminides have also been investigated. 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. Role of impurity has been assessed and precluded as a possible cause for this polymorphic change. Besides this fundamental study, development of Al-based nanocrystalline and/or amorphous alloys has been another actively pursued area by the phase transformation group in the recent past. Several Al-Cu-TM and Al-TM-Si (TM = transition metal) Al-Ni-Ti ternary alloys, and rare earth metal containing Al alloys have been synthesized and characterized to explore the possibility of developing bulk amorphous Al-alloy by mechanical alloying and identifying the criteria of selection of the amorphous forming compositions. Currently, the genesis of solid-state amorphization and polymorphic changes is being investigated using positron annihilation and nuclear magnetic resonance studies (in collaboration with SINP, Kolkata).

In addition to the above, the mechanism of recrystallization and texture development in aluminium alloys for packaging purpose is being investigated, and considerable progress has been achieved. 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 ledeburitic transformation. In addition, the detailed crystallography of Cr-rich M<sub>23</sub>C<sub>6</sub> 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. Recently, a plasma immersion ion implantation (PIII) facility has 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. 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.

The present activities of **Powder Metallurgy** group include synthesis of particulate reinforced mullites and their property evaluation, production of Al<sub>2</sub>O<sub>3</sub> reinforced Ni<sub>3</sub>Al 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-Al<sub>2</sub>O<sub>3</sub>, Al-MgAl<sub>2</sub>O<sub>4</sub>, Al-TiC and Al-TiB<sub>2</sub> 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. Research has been initiated in areas of semi-solid processing for casting and forming operations on Al-alloy matrix composites. In addition, significant progress has been achieved in synthesis of Fe-TiC, Fe-ZrC and Fe-TiB<sub>2</sub> composites from some cheap raw materials by aluminothermic reduction method. The Fe-TiC composite, processed from a waste product of an aluminium extraction plant, has the potential to be used as a cutting tool material.

Besides, the mechanical behaviour 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 Surface Engineering is one of the major thrust area 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 shape region of engineering components (of stainless steel, copper and titanium based alloys) can significantly improve the resistance to wear, corrosion, oxidation and similar surface dependent degradation.

Recently, a new effort has been initiated to exploit **plasma assisted ion implantation** for on-line-of-sight surface engineering of Fe/Ti- based components. In addition, another effort has been directed towards development of a plasma sprayed coating from a few commercially available and inexpensive ceramic materials of Indian origin, i.e, alumina, plasma dissociated zircon and some composite ceramic powders.

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 behaviour of multi-phase refractory metal-silicides like Molybdenum and Niobium Silicides are in progress. In the area of aqueous corrosion, the current activities are concentrated on the studies of corrosion behaviour of amorphous and nanocrystalline Zr-based binary alloys, corrosion and stress corrosion performance of aluminium based composites and Al-Ni alloys and stress corrosion cracking of nickel alloys in hydrogen fluoride.

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 first phase of the project would focus on the LIB Technology development in India. The ability to fabricate cells with existing materials, both at the laboratory experimental scale and prototype industrial scale, would be demonstrated quickly in IIT. In the second phase, fundamental R&D, which will be conducted in five participating institutions would locate new, better, more efficient, and cheaper anode, cathode and electrolyte materials to create the next generation of products. Smaller cells/batteries would be scaled-up to larger cells/batteries as portable power source for electric vehicles, which will be demonstrated to the government at the end of the Project.

**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 Surface alloying
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

**New Acquisitions :**

1. LEICA DM 2500M Optical Microscope
2. LEICA DM 2500M RL(BF) Binocular Metallurgical Research Microscopes
3. Different types of High Temperature Furnaces
4. Ultrasonic Velocity Gauge, Model 35 DL
5. Dynamic Elastic Properties Analyzer DEPA Light System
6. Geosyn Belt Grinder Machine
7. Ecomet 3000 Variable speed Grinder/Polisher, BUEHLER LTD, USA

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Development & characterization of biocompatible low modulus titanium alloys for total joint replacement	CSIR	11.96 Lakhs

2.	Development and characterization of copper based brazing alloy by rapid solidification and mechanical alloying	ISRO and KCSTC	2.20 Lakhs
3.	Development and Characterization of Nano-fluid for Micro-thermal Heat Transfer Applications in Advanced Satellite	ISRO and KCSTC	5.00 Lakhs
4.	Development and Characterization of Novel Nanocrystalline Metallic/Ceramic Based Hydrogen Sensor Materials	MHRD, New Delhi	15.00 Lakhs
5.	Development of Niobium Silicide Based Alloys and Composites for Elevated Temperature Applications	DRDO	32.37 Lakhs
6.	Development of Ferrite-bainite Dual Phase steels for automobile Applications	DST	7.44 Lakhs
7.	Development of high strength in situ Al-TiC Composites	DRDO	31.56 Lakhs
8.	Development of Molybdenum and Niobium silicide based alloys and composites for elevated temperature applications	DRDO	32.41 Lakhs
9.	Development of multifunctional surface on Ti and its alloys for tailoring wear resistance and biocompatibility	CSIR	10.00 Lakhs
10.	Development of nanocrystalline coating by combined plasma assisted implantation and deposition	DST	53.00 Lakhs
11.	Development of niobium silicide based alloys & composites for elevated temperature applications	DRDO	32.41 Lakhs
12.	Development of Wear-resistant Cu-alloy with Nanocrystalline Ceramic Phase Dispersion by Mechanical Alloying for Electrical Contact and Component	International Copper Association, USA	12.00 Lakhs
13.	Effect of Cyclic Oxidation and Residual Stresses on Oxidation Kinetics and Mechanisms of Molybdenum Silicide Based Alloys and Composites	DRDO	22.95 Lakhs
14.	Establishment of an advanced research facility for EB welding and process development related to programs of interest to DAE	BRNS, DAE	132.53 Lakhs
15.	Feasibility study for extraction of vanadium and titanium from titano-magnetite ore deposit of Maharastra - Part-I : Pre-feasibility study for vanadium	Maharastra State Mining Corporation	7.29 Lakhs
16.	FIST : Vacuum Melting & Casting Furnace	DST	100.00 Lakhs
17.	High Speed Laser Processing of Amorphous and Nanocrystalline Coating on Metallic Substrate	DST and NSF, USA	13.00 Lakhs



18.	High Speed Laser Synthesis of Amorphous Surface Structure	DST and NSF USA	17.00 Lakhs
19.	High strength formable steels for automobile applications	Tata Steel	11.57 Lakhs
20.	High strength formable steels for automobile applications	Tata Steel	14.33 Lakhs
21.	Interface Studies in Ceramic Particulate / Fibre Reinforced Advanced Composites	DRDO	13.93 Lakhs
22.	Investigations into nucleation and growth in ultra thin films of metals	DRDO	361.00 Lakhs
23.	Laser Assisted Fabrication of Compositionally Graded Component for Hip Joint and Femoral Replacement	CSIR	18.00 Lakhs
24.	Laser assisted manufacturing and Drilling of Compositionally graded coating	CSIR	13.00 Lakhs
25.	Analysis of oxide materials for rechargeable lithium ion batteries using genetic algorithm	RCU, Hyderabad	20.88 Lakhs
26.	Mathematical modeling of solidification behaviour of weld pool and oxidation characteristics of zones of weldment during laser welding of plain carbon	DST	22.70 Lakhs
27.	Mechnosynthesis and mechanical thermal synthesis of in-situ aluminium based nanocomposites and their characterization	DST	43.15 Lakhs
28.	Mushy state processing Al alloy based in situ Metal Matrix Composites	CSIR	4.86 Lakhs
29.	Physico-Chemical Analysis of Metal Based Ayurvedic Bhasma Drugs by Sophisticated Modern Instrumental Methods	DST	20.35 Lakhs
30.	Production of porous TiNi shape memory alloys from mechanically alloyed powders for biomedical applications - A Fast Track Research Scheme	DST	10.00 Lakhs
31.	Residual stress developed in laser surface alloying & its effect on corrosion property	IIT, Kharagpur	1.00 Lakhs
32.	Semisolid Processing of Al-Mg base alloys under low convection conditions	CSIR	10.71 Lakhs
33.	Simulation and Fabrication of CVD/CVI set up for Ceramic Matrix in general and Reinforced Graphite matrix Composites in Particular	DRDO	13.70 Lakhs
34.	Structure-Property Relations In Ceramic Composites For High Temperature Applications In Nose Cone Tiles In Hypersonic Vehicles	DRDL	72.96 Lakhs
35.	Surface Engineering of Ballbearing Steel by Plasma Ion Implantation	Tata Steel	10.00 Lakhs

36.	Synthesis and Characterization of Al-based Nanocrystalline Composites	DST-KBN (Indo-Poland)	4.50 Lakhs
37.	Synthesis and characterization of in-situ carbide reinforced austenitic manganese steel matrix composites	Naval Research Board	27.92 Lakhs
38.	Synthesis and characterization of nanocrystalline ZrO <sub>2</sub> -based electrolyte materials for Solid Oxide Fuel Cell	CSIR	12.00 Lakhs
39.	Synthesis and Characterization of Nanostructured Materials for Functional and Structural Applications	DST	280.00 Lakhs
40.	Synthesis and properties of electrodeposited Nickel/Ceria nano composites	IREL	27.81 Lakhs
41.	Theoretical Prediction & Experimental Measurement of Residual Stress Developed in Laser Surface Engineering	DST	10.00 Lakhs
42.	Thermal stress modeling and design of twin roll caster to obtain thin alloy sheet with extremely fine/amorphous structures	DST	37.53 Lakhs
43.	Ultra fine grained low carbon steel using accumulative roll bonding : An exploratory study	Tata Steel	3.72 Lakhs

**Consultancy Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Cellular Automation Modeling of Austenite to Ferrite & Austenite to Pearlite Transformations in Steels	Tata Steel	2.80 Lakhs
2.	Development of air cooled microalloyed steel with improved toughness for forging applications	Ashok Leyland	12.00 Lakhs
3.	Development of new metallic coating for low carbon steels	Tata Steel	8.02 Lakhs
4.	Genetic Algorithms in hydrocyclones	TATA Steel	7.00 Lakhs
5.	Grain Refinement of Al Alloys (LM25; BS1490) for higher strength (Chill Casting and TF Condition)	NSTL, Vishkhapatnam	3.50 Lakhs
6.	Metallurgical investigation of failed wire samples	Usha Martin Limited	0.20 Lakhs
7.	Standardization of process parameters for the manufacture of Hadfield Mn-Steel	L&T Kansbahal	1.15 Lakhs
8.	Structure-property correlation in free-cutting steel	Usha Beltron Ltd	4.20 Lakhs
9.	Throughput improvement of SMS unit of Adhunik Metaliks Limited	Adhunik Metaliks Limited	17.00 Lakhs

## VISITS ABROAD BY FACULTY MEMBER

1. Prof. Brij Kumar Dhindaw To participate in the International Workshop (Ames, Iowa, USA, ) September 17 – October 05, 2006
2. Prof. Madhusudan Chakraborty To participate in the Golden Jubilee celebration of UiTM and to sign MoU on behalf of IIT Kharagpur (University of Technology Mara (UiTM); Kuala Lumpur, Malaysia) November 6-11, 2006.
3. Prof. Madhusudan Chakraborty To attend Regional PANIIT Meet (Singapore) August 25-28, 2006
4. Prof. Sarat Chandra Panigrahi To attend MS&T 2006 (Cincinnati, USA) October 15-19, 2006
5. Prof. Sarat Chandra Panigrahi Workshop on setting up a R&D facility on Metals, Material, Science, Engineering and Technology (University of Trinidad & Tobago. Port of Spain, ) August 5–12, 2006
6. Prof. Madhusudan Chakraborty To develop proposals for collaboration between IIT Kharagpur, Georgia Tech and TU Eindhoven (Georgia Institute of Technology Atlanta USA) (5 weeks) May-June, 2007
7. Prof. Brij Kumar Dhindaw Visiting Scientist (research on the solidification behaviour of intense shear processed alloys) (Brunel Center for Advanced Solidification Technology (BCAST) Brunel University, West London UK) (Two months) May 15 – July 15, 2007
8. Prof. Siddhartha Das Guest Scientist (University of Ulm, Germany) (5 weeks) June 02 – July 13, 2007
9. Prof. Nirupam Chakraborti Visiting Scientist to deliver a series of lectures on Genetic Algorithms (Ames Laboratory, USA) (2 months) May 24 – July 20, 2007
10. Prof. Nirupam Chakraborti To deliver a key Note Lecture in IPDO 2007 (Miami, USA) (One week) April 16-20, 2007
11. Prof. Nirupam Chakraborti European Union Guest Docent to deliver a series of lectures on Genetic Algorithms (University of Linz, Austria) 3 months
12. Prof. Madhusudan Chakraborty To discuss possibilities of collaborative work on biofuel and neglected diseases (Univeristy of California Berkeley) 9th July 2007
13. Prof. Indranil Manna Visiting Professor, Collaborative research on ECAP consolidation of amorphous Al alloy (DFG project) (Technical University of Clausthal, Germany) (2 months) May-July 2006
14. Prof. Indranil Manna Visiting expert, Curriculum development of a new University (Univ of Trinidad & Tobago) (University of Trinidad and Tobago, Port of Spain) (One week) August 2006
15. Prof. Indranil Manna International collaborative (Indo-Polish) research project; EMRS and ISMANAM International Conf (High Pressure Research Institute (Unipress), Warsaw, Poland) (2 weeks) August-September 2006

16. Prof. Indranil Manna Expert committee meeting of Euro-India Network project on NANOTECHNOLOGY (Sociedade Portuguesa da Inovação (SPI), Porto, Portugal, ) September 14-15, 2006
17. Prof. Indranil Manna Indian (DST) delegation member, India-Brasil-South Africa (IBSA) scientific collaboration project (UFRGS (Rio Grande do Sul), INMETRO, CENPES/Petrobrás (Rio de Janeiro), UFRJ, EMBRAPA (Sao Paolo), UNICAMP, LNILS (Campinas)) (One week) November 5-11, 2006
18. Prof. Indranil Manna Invited lectures on Nanomaterials, Nanfluid, Surface engineering (Georgia Technological Univ (Atlanta), Wright State University (Dayton), Colorado School of Mines (Golden) USA) (One day in each place) March 26-29, 2007
19. Prof. Indranil Manna DST-NSF International Collaborative Research Project and Lecture trip to 3 Universities in USA (University of Tennessee, Knoxville, USA) (Two weeks) March 17-31, 2007
20. Prof. Indranil Manna Independent research on deformation behavior of bulk metallic glass under Euro-Space agency project (Visiting Professor, University of Ulm, Germany) (Two months) May-July 2007
21. Prof. Indranil Manna Invited lecture and Collaboration on Mg-alloy technology (Inst. for Mater. Res., GKSS, Geesthacht, Germany (Prof K U Kainer)) (3 days) June 13-15, 2007
22. Prof. Uday Kumar Chatterjee Attended the 16<sup>th</sup> European Conference of Fracture (ECF 16), held at Alexandroupolis, Greece, July 3-7, 2006.

#### LECTURE BY VISITING EXPERT

1. Prof. Rajarshi Banerjee, University of North Texas, Denton, USA Evolution of nanoscale microstructures in complex beta titanium alloys
2. Dr. Kallol Mondal, Research Associate, NIMS, Japan Bulk Zr – based metallic glasses with high glass forming ability and their mechanical properties
3. Dr. George F. Vander Voort, Director, Buehler Inc., USA Principles of microstructural Characterization
4. Dr. Abhijit Dutta, Former Scientist G, DMRL, Hyderabad Superplastic forming and innovations
5. Prof. Sharmila M. Mukhopadhyay, Wright State University, Dayton, USA Nanoscale modification of complex solids
6. Prof. Sudipta Seal, Nano Initiative Co-ordinator for UCF, Associate Professor, Surface Engineering & Nanotechnology Lab., University of Central Florida, USA Functional nanomaterials

7.	Dr. Dipankar Ghosh, North Carolina State University, USA	Tunable microwave devices using BST (Barium Strontium Titanate) and base metal electrodes
8.	Dr. B. K. Das, Former ED, C-Met, Pune, Hyderabad & Thrissur	Electronic packaging – material and process issues
9.	Prof. Koh-ichi Sugimoto, Shinshu University, Japan	Ultra – high and high – strength TRIP aided steels
10.	Dr. R. K. Dayal, Head, Corrosion Sc. & Technology Section, IGCAR, Kalpakkam	Structure & engineering of Indian database on mechanical and corrosion metallurgy
11.	Dr. Debasis Majumdar, Eastman Kodak Co., New York, USA	Application of Nanocomposites in Imaging and Display Media

#### INVITED LECTURES BY FACULTY MEMBERS

1.	Prof. Brij Kumar Dhindaw	Peritectic transformation during solidification of steel (Ispat industries, Dolvi, Maharashtra)
2.	Prof. Brij Kumar Dhindaw	Advanced materials (Telcon, Jamshedpur)
3.	Dr. Gour Gopal Roy	Computational Fluid Flow, heat and mass transfer in Metallurgical Processes: a case study (Jadavpur University, Kolkata)
4.	Prof. Shyamal Kumar Pabi	Microalloyed steels - Structure property correlations (TELCON Jamshedpur)
5.	Prof. Madhusudan Chakraborty	Development of aluminium alloy based in situ metal matrix composites (Georgia Tech., Atlanta USA)
6.	Prof. Kalyan Kumar Ray	Aspects of structural integrity in relation to processing and quality control of steel (Kolkata, Institute of Engineers, Kolkata chapter, September 01, 2006 [A. K. Seal Memorial lecture])
7.	Prof. Kalyan Kumar Ray	Early stage of crack initiation towards damage of structural materials (Bhaba Atomic Research Centre, Mumbai, September 12, 2006)
8.	Prof. Kalyan Kumar Ray	Advances and challenges in materials engineering: the integrity (Central Mechanical Engineering Research Institute, Durgapur, March 23, 2007)
9.	Prof. Kalyan Kumar Ray	Thermomechanical Treatment of Steel (Metal House, Kolkata, March 17, 2007 (Workshop on heat treatment of steel))
10.	Prof. Indranil Manna	Laser and Plasma Assisted Surface Engineering of Austenitic and Ferritic Stainless Steel (Presented as an invited talk at the International Symposium on Advances in Stainless Steels 2007 (ISAS 2007), held in Chennai during April 9-11, 2007 (Convenor: K Bhanu S. Rao).)
11.	Prof. Indranil Manna	Nano-particle Dispersed Water and Ethylene-glycol Based Nanofluid for Heat Transfer Applications (Presented at the India-Brazil-South Africa Collaborative Symposium on Nanotechnology held in IGCAR, Kalpakkam on Feb. 6, April 6, 2007 (Convenor: Dr A K Tyagi).)

12. Prof. Indranil Manna Nano-Materials Research at IIT-Kharagpur (Presented as an invited talk at the European Union – India Network project workshop (Bridging the Gap between Europe and India’s Nanotechnology Knowledge Bases) held in Ashok Hotel, New Delhi on March 03, 2007 (Convenor: Prof V K Kaul))
13. Prof. Indranil Manna Surface Engineering of SAE 52100 Steel (Presented as an invited talk in TRIBO-CORROSION 2006, an International Symposium on Tribo-Corrosion held in NFTDC, Hyderabad on Dec. 4-5, 2006 (Chair: G. Sundararajan, Margaret M. Stack).)
14. Prof. Indranil Manna Science and Technology of Nano-Materials for Structural+Functional Applications (Presented at the India-Brazil-South Africa Collaborative Symposium on Nanotechnology held in LNLS, Campinas, Brazil on November 10, 2006 (Convenor : Dr J A Brum))
15. Prof. Indranil Manna Science and Technology of Nanometric Materials – Activities at the IIT-Kharagpur (Presented as an invited talk at the European Union – India Network project workshop (Bridging the Gap between Europe and India’s Nanotechnology Knowledge Bases organized by Sociedade Portuguesa de Inovação, SPI) held in Porto, Portugal on September)
16. Prof. Indranil Manna Polymorphic Phase Transformation in Early Transition Metals Induced by Mechanical Attrition/Alloying (Presented in the 12th International Symposium on Metastable and Nano Materials (ISMANAM) held in Warsaw, Poland during August 27-30, 2006 (Chairmen: T. Kulic))
17. Prof. Indranil Manna Evolution of Amorphous/Nanocrystalline Microstructure in Al-based Ternary Alloys by Mechanical Alloy (Presented in the 8th International Conference Nanostructured Materials (NANO 2006) in Bangalore during August 21-25, 2006 (Chairmen: K. Chattopadhyay, A. H. Chokshi))
18. Prof. Indranil Manna Nanometric dispersion in Amorphous Al-Alloys and Nano-Fluids (An invited lecture delivered in Inst. for Mater. Research, GKSS, Geesthacht, Germany on June 15, 2007 (host: Prof Dr K U Kainer))
19. Prof. Indranil Manna Surface Engineering of Metallic Systems by Laser and Plasma (Invited lecture delivered at the Mater Engineering Department, Colorado School of Mines, Golden, USA on March 29, 2007 – ASM-TMS Chapter lecture (host: Prof B Mishra))
20. Prof. Indranil Manna Nano-dispersed Solid Alloys and Thermal Fluids (An invited lecture WSU-ASM Joint Seminar on Nanotechnology at the Wayne State University, Dayton, USA on March 28, 2007 (host: Prof S Mukhopadhyay))

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| 21. | Prof. Indranil Manna | Nanostructured Materials for Structural and Functional Applications (Invited seminar delivered at the Mechanical Engineering Department, Georgia Technological University, Atlanta, USA on March 26, 2007 (host: Prof Y Joshi).) |
| 22. | Prof. Indranil Manna | Laser Assisted Material Processing (Invited lecture delivered at the Institute for Plasma Research (IPR), Gandhinagar on November 24, 2007 regarding Materials Projects for National Fusion Programme (host: Dr S Mukherjee).)   |
| 23. | Prof. Indranil Manna | Nanometric material characterization by x-ray diffraction (Invited lecture delivered at the National Institute for Foundry and Forge Technology (NIFFT), Ranchi on September 26, 2006 (host: Prof M K Banerjee).)                |
| 24. | Prof. Indranil Manna | Recent developments in nanometric materials in structural and functional applications (An invited lecture delivered at the University of Trinidad and Tobago, Port of Spain on August 8, 2006 (host: Prof K D Srivastava))       |
| 25. | Prof. Indranil Manna | Characterization of nanometric materials synthesized by mechanical alloying (Invited lecture delivered at the University of Chile, Santiago on June 19, 2006 (host: Prof R. Letelier).   |

#### THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	K. Ram Mohan Rao	Surface Modification of Metallic Materials by Plasma Immersion Ion Implantation to Enhance Hardness and Resistance to Wear and Corrosion
2.	Asit Kumar Khanra	Production and Sintering of Nanocrystalline ZrB <sub>2</sub> Powder and Development of ZrB <sub>2</sub> – Cu Composites
3.	Sheela Singh	Studies on Formation of Si <sub>3</sub> N <sub>4</sub> -MoSi <sub>2</sub> In-Situ Composites from Mo-Si <sub>3</sub> N <sub>4</sub> Powder Mixtures
4.	S. Narendranath	Some Studies on the Phase Transformation and Mechanical Behavior of Ti-Ni Shape Memory Alloys
5.	Sanjeev Das	Synthesis and Characterization of Al-4.5 wt% Cu/Zircon Sand Composite Produced by Stir Casting Route
6.	Monideepa Mukherjee	Deformation Induced Transformation of Retained Austenite in TRIP Aided Steels
7.	Payodhar Padhi	Experimental and Theoretical Studies on Particle Distribution in Cast Aluminium-Based Metal Matrix Composites
8.	B. Ramesh Chandra	Studies on Laser Assisted Composite Surfacing of Commercial Metals and Alloys for Tribological Application
9.	Rajat Kumar Roy	A Study on Recrystallization Behavior and Mechanical Properties of Some Aluminium Packaging Alloys

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|-----|-------------------|---|
| 10. | A. K. Prasad Rao  | On the Grain Refinement and Modification of Some Hypo-eutectic Al-Si Alloys.  |
| 11. | S. Muthu Kumar    | Development and Characterization of Magnesium and its Alloy Based SiC <sub>p</sub> Reinforced MMC by Infiltration Route |
| 12. | S. M. Ganeshan    | Laser Assisted Fabrication of AISI 316L Stainless Steel and Co/Ti6Al4V for Hip and Femoral Prosthesis                   |
| 13. | Swapn Kumar Karak | Synthesis and Characterization of Mg <sub>2</sub> Si Reinforced Al-4.5 wt% Cu Matrix Composites                         |
| 14. | Sankalp           | Studies on Metastability in Aluminum based Binary Immiscible Alloys Synthesized by Mechanical Alloying                  |

#### **PATENTS GRANTED**

- |    |                                   |   |
|----|-----------------------------------|---|
| 1. | Prof. Indranil Manna              | Device for measuring the thermal conductivity of a fluid with dispersion of ultra-fine solid particles  |
| 2. | Prof. Madhusudan Chakraborty      | A process for the manufacture of MgAl <sub>2</sub> O <sub>4</sub> reinforced Al Matrix Composites using solid silica sources  |
| 3. | Prof. Siddhartha Das              | A set of plasma sprayed ceramic coatings  |
| 4. | Prof. Madhusudan Chakraborty      | Modifiner- a novel master alloy for grain refinement and modification of hypoeutectic Al-Si alloys  |
| 5. | Dr. Rahul Mitra and Y. R. Mahajan | Reaction hot pressing technique for processing of Ti <sub>5</sub> Si <sub>3</sub> based material (Indian Patent No. 197166, 2006)   |
| 6. | Prof. Uday Kumar Chatterjee       | A process for producing wear resistant cast iron by smelting reduction of waste products like red mud and desilicated sand (Filed 2003), Patent granted (Intimation No. 405/kol/03-A, dt. 1.11.2006). |
| 7. | Prof. Uday Kumar Chatterjee       | Monel alloy resistant to stress corrosion crack in hydrofluoric acid (Filed 2004), Patent granted (Intimation No. PO/Kol/2007-08/475, dt. 8.5.2007), Patent No. 208136.                               |

#### **LAURELS & DISTINCTIONS**

- |    |                        |   |
|----|------------------------|---|
| 1. | Dr. Rahul Mitra        | Awarded ARC-I Award for best paper in the International Symposium of Research Scholars (2006)   |
| 2. | Prof. Kalyan Kumar Ray | Awarded First prize in Metal Science Category in the 60th Annual Technical Meeting of the Indian Institute of Metals (2006)                                   |
| 3. | Dr. Rahul Mitra        | Awarded 2nd prize in non-ferrous category in the 60th Annual Technical Meeting of the Indian Institute of Metals (2006)                                       |
| 4. | Prof. Kalyan Kumar Ray | Awarded the "Best Paper" award during International Symposium for Research Scholars on Metallurgy, Material Science and Engineering, IITM Chennai, Dec (2006) |



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|----|---------------------------|---|
| 5. | Prof. Nirupam Chakraborti | European Union Guest Docent Award tenable at University of Linz (2006)  |
| 6. | Prof. Indranil Manna      | Honorary Advispr, DAAD (German Academic Exchange Service) 2006-onwards (2006)   |
| 7. | Prof. Indranil Manna      | INAE-AICTE Distinguished Industry Professor (2007), awarded by the Indian National Academy of Engineering jointly with Tata Steel, Jamshedpur |
| 8. | Prof. Indranil Manna      | Judged as Outstanding (top 20%) Reviewer by the Metallurgical and Materials Transactions, A, 2007   |
| 9. | Dr. Rahul Mitra           | Judged as Outstanding (top 20%) Reviewer by the Metallurgical and Materials Transactions, A (2006)  |

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

- |    |   |                      |
|----|---|----------------------|
| 1. | Conference of IIT Kharagpur Alumni in US Academia   | July 6-8, 2007       |
| 2. | International Conference on Solidification Science and Processing   | November 19-23, 2006 |
| 3. | Microalloyed Steels: Emerging Technologies and Applications   | March 9-11, 2007     |
| 4. | Hydroplant Operations for Hindustan Zinc Limited , short term course  | January 4-18, 2007)  |
| 5. | COMPOSIT ( <i>Congress of Metallurgical Professionals invOlving Students, Industry and Teachers</i> ); a national meet conducted by the Society of Metallurgical Engineers, Department of Metallurgical and Materials Engineering, Indian Institute of Technology Kharagpur | March 17-19, 2007    |

## DEPARTMENT OF MINING ENGINEERING

**HEAD : Professor Karanam Uma Maheshwa Rao**

### FACULTY

#### Professor :

Bhattacharya, Jayanta	Ph.D. (IIT Kharagpur), Reliability and Quality Engineering
Bhattacharjee, 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
Pathak, Khanindra	Ph.D. (London University), Mining Machinery, Surface Mining, Mine Closure Planning, Environmental Management
Rao, Karanam Uma Maheshwar	Ph.D. (IIT Kharagpur), Rock Mechanics, Underground Metal Mining Methods
Sastry, Bhamidipati Suryan	Ph.D. (Utah), Mine Environment

#### Associate Professor :

Deb, Debasis	Ph.D. (Alabama University, USA), Rock Mechanics, Numerical Methods, GIS, AI
Modak, R N	M.E., M.Sc.(Engg.), Mine Surveying, Photogrammetry, Operations Research, Mineral Economics
Pal, Samir Kumar	Ph.D. (IIT Kharagpur), Mining Machinery, Geomatics, Rock Mechanics, Material Handling in Mines

#### Assistant Professor :

Chakravarty, Debashish	Ph.D. (IIT Kharagpur), Rockmechanics, Blasting & Ground Control, Digital Image & Signal Processing Applications, GIS & GPS, Numerical Analysis, AI and Virtual Reality, Evolutionary Computing Techniques
Samanta, Biswajit	Ph.D. (IIT Kharagpur), Geostatistics, Quality Control, Artificial Intelligence

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

#### Faculty Promotion :

Dr. Debasis Deb	Associate Professor
Dr. S. K. Mukhopadhyay	Professor

**Faculty Retirement :**

Mr. R. N. Modak                      Associate 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; 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, stichastic 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.

**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. 3- D Laser Scanner for Dump Slope Monitoring

## ON-GOING RESEARCH PROJECTS

### Sponsored Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Investigation on Augmentation of Life of Dump-Truck Tyres through the Improvement of Tyre Retreading Compound and Development of an Optimum Road Main	Coal India Ltd.	148.69 Lakhs
2.	An Epidemiological Study to Assess the Role of Individual Characteristics and Working Environment on Coal Miners Injuries	MHRD	10.00 Lakhs
3.	Application of DGPS and High Precision Satellite Imagery for Subsidence Monitoring in Raniganj Are of ECL	CIL R&D	242.42 Lakhs
4.	Application of High Precision Satellite Imaging and DGPS Technology for Online, Wide-Area Subsidence Monitoring Study in Raniganj Area, ECL of CIL	Coal India Limited	242.42 Lakhs
5.	Automatic and Intelligent System for Fragmentation Determination in a Blasted Muck	IIT Kharagpur	3.00 Lakhs
6.	Determination of rate of consolidation, flow rate, settlement and load bearing characteristics of fly ash slurry after stowing	TIFAC	13.20 Lakhs
7.	Development and Implementation of Extended Finite Element Procedures (XFEM) for Cohesive Rock Joints	DST	16.50 Lakhs
8.	Development of a mixed-culture bio-reactor for mine drainage treatment	Korea Institute of Geosciences and Mineral Resources, South Korea	9.00 Lakhs
9.	Development of Mining Machinery Laboratory	MHRD	20.00 Lakhs
10.	Environmental Hotspot monitoring in Korba Area	Space Application Centre (SAC)	16.00 Lakhs
11.	FIST Programme	DST	32.00 Lakhs
12.	Integration of GPS and InSAR data for Accurate Ground Profile Determination	SHELL International & Exploration BV	40.00 Lakhs
13.	Investigation on Augmentation of Life of Dump-Truck Tyres through the Improvement of Tyre Retreading Compound and Development of an Optimum Road Maint	Coal India Limited	148.69 Lakhs
14.	Investigation on Ensemble modeling approach by Multiple Neural Network using Negative correlation learning for orebody modeling	ISIRD	3.00 Lakhs
15.	Model Studies on the Efficiency of Gravity Blind Backfilling Method and Evolution of a Pre-jamming Indication Parameter.	Ministry of Coal	14.66 Lakhs

16.	Optimal Selection of Radial Basis function network for orebody modeling using multiobjective genetic algorithms	DST	2.88 Lakhs
17.	Quality Assurance and Supply Chain Management of R.O.M. Limestone	Gujarat Ambuja Cements Limited	1.50 Lakhs
18.	Remote Sensing GIS based data infrastructure for baseline environment for new uranium mining sites	BRNS	34.00 Lakhs
19.	Resource Evaluation of Beach Sands Through Geostatistical and Other Computational Methods	CSIR	2.20 Lakhs
20.	Risk based mine production scheduling using conditional simulation and genetic algorithms for ore grade control	SERC	9.10 Lakhs
21.	Risk based Mine Scheduling using Conditional Simulation and Genetic Algorithms	DST	9.17 Lakhs
22.	Technical Study for Stability of Old and Active OB Dumps in WCL for the Dimensional Optimization	CIL R&D Grant	359.00 Lakhs
23.	The risk analysis is basis of safety management in the Indian mining industry	MHRD	6.00 Lakhs
24.	To formulate environmentally sensitive action plan for mine closure planning and rehabilitation of ecologically degraded areas of Korba and Environs	Space Applications Centre, Ahmedabad	15.15 Lakhs

#### Consultancy Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Design and Stability Analysis of Crown / Sill Pillars below A Filled Stope	Hutti Gold Mines Ltd.,	10.97 Lakhs
2.	Design and Stability Analysis of Stopes in North, South and North extension Blocks at Bangur chromite Mine, OMC	Orissa Mining Corporation (OMC)	3.20 Lakhs
3.	Development of a Pit Optimization software	KIGAM, Korea	4.50 Lakhs
4.	Development of Image Processing Technique for Analyzing Rock Joints	Korea Institute of Geosciences and Mineral Resources (KIGAM), South Korea	10.00 Lakhs
5.	Fundamentals of GPS Technology alongwith its Applications	TISCO	0.00 Lakhs
6.	Investigations of Tailings Dam at Sukinda Chromite Mine	Tata Steel	1.00 Lakhs
7.	Numerical Modelling & Stope Design at Bangur Underground Mine	Orissa Mining Corporation Ltd.	3.18 Lakhs

8.	Pit Optimization of Surface Coal Mine (Korea Institute of Geosciences and Mineral Resources)	KIGAM, South Korea	4.50 Lakhs
9.	Pressure-quantity survey and network analysis at the GDK-8 & 8A incline integrated circuit, RG-II, SCCL	SCCL	2.80 Lakhs
10.	Resource Evaluation at Srikurmam Beach Sand Project (Trimex Industries, Rs.0.75 Lakhs)	Resource Evaluation at Srikurmam Beach Sand Project (Trimex Industries, Rs.0.75 Lakhs)	0.75 Lakhs
11.	Rock mass characterization	Uranium Corporation Of India Ltd.	1.50 Lakhs
12.	Rock testing and numerical modeling for slope design at Bangur Chromite Mines	Indian Bureau of Mines, Nagpur	2.50 Lakhs
13.	Scientific study of slope stability at Goutam Khani opencast mines, Kothagudem area	Singareni Collieries Co. Ltd.	3.47 Lakhs
14.	Stability Ananalysis of Crown Pillars at Hutty Gold Mine	Hutty Gold Mine Limited	11.00 Lakhs
15.	Statistical Analysis of Granite Rock Samples	Ennore Port Ltd., Chennai	4.84 Lakhs
16.	Studies on the stability of Underground mine openings and subsidence investigations at Tummallapali project of UCIL	Uranium Corporation of India Ltd	0.50 Lakhs
17.	Study on Backfill Material Composed of Fly Ash / Bottom Ash and Mill Tailings of UCIL	TATA Power Company Limited, Jamshedpur	4.98 Lakhs
18.	Testing and Characterization of Rock Parameters from a Proposed Uranium Mine in AP	Uranium Corporation of India Limited (UCIL)	1.96 Lakhs

#### **VISITS ABROAD BY FACULTY MEMBER**

1.	Dr. Debasis Deb	Project Related, Data collectons and Discussion with the Client (Pasir Mine, Kalimantan, Indonesia) 5 days
2.	Dr. Debasis Deb	Project Related (Korea Institute of Geoscience and Mineral Resources (KIGAM), South Korea) 10 days
3.	Dr. Debashish Chakravarty	ISCSM 2006 (RWTH Aachen) 4 days
4.	Dr. Debashish Chakravarty	Project related Discussions (SHELL International and Exploration BV, The Netherlands) 5 days
5.	Prof. Karanam Uma Maheshwar Rao	Deliver Lectures (University of Adelaide) 28 Feb – 7 March
6.	Prof. Jayanta Bhattacharya	Brainpool Senior Scientific Researcher (KIGAM, Daejeon, South Korea) 9 months
7.	Prof. Jayanta Bhattacharya	As an author and delegate to the International Mine Water Association's Annual Conference (Cagliari, Sardinia, Italy) 7 days

#### LECTURE BY VISITING EXPERT

1. Dr. Dwayne Tannant (Professor, Dept. of Mining Engg., Univ. of Alberta, Canada) Use of Photogrammetry for rock slope characterization, U/G supports, Oil Sands mining in Canada

#### INVITED LECTURES BY FACULTY MEMBERS

1. Prof. Jayanta Bhattacharya Microbial Influences on Acid Mine Drainage; South Korea

#### THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	S. K. Mukhopadhyay	Studies on workplace and some human behavioral attributes towards underground coal mines injuries
2.	Snehamoy Chatterjee	Geostatistical and vision based quality control models for Indian Mineral Industry
3.	Mallika Arjun Rao	A quality of life approach for assessing societal impact of mining for mine closure planning

#### BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	Dr. Debasis Deb	Finite Element Method : Concepts and Applications in Geomechanics	Prentice Hall of India	2006
2.	Prof. Jayanta Bhattacharya	Corporate Social Responsibility : Ethical and Strategic Choice	Asian Books Pvt. Limited, New Delhi	2007

#### LAURELS & DISTINCTIONS

1. Prof. Samir Kumar Das The National Design and Research Forum, under IE (I) awarded National Design Award in Mining Engineering for outstanding contribution in Design

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

1. Mine Management July 25-28, 2006
2. Mine Safety and Legislation March 19-23, 2007
3. Mines Safety and Legislation March 23-27, 2007

## DEPARTMENT OF OCEAN ENGINEERING & NAVAL ARCHITECTURE

**HEAD : Professor Debabrata Sen**

### **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
Seb, D.	Ph.D., Marine and Ocean Hydrodynamics, Numerical Hydrodynamics
Sha, O. P.	Ph.D., CAD/CAM in Marine Design & Production, Marine Design & Production
Sheikh, A. H.	Ph.D., Ocean Structures, Ship Structures, Structural Engineering

#### **Associate Professor :**

Sahoo, T.	Ph.D., Coastal Hydrodynamics, Hydroelasticity, Marine and Ocean Hydrodynamics
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#### **Assistant Professor :**

Bhar, Ashoke	Ph.D., Ocean Engineering Structures
Warrior, Hari, V.	Ph.D., Ocean circulation Modeling
Bhaskaran, Prasad Kumar	Ph.D., Physical & Dynamical Oceanography, Numerical Modeling of Ocean Waves, Coastal Processes, Tsunamis

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

#### **Faculty Promotion :**

Prof. A. H. Sheikh	Professor
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### **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 :**

1. 2D – Wave Maker

**ON-GOING RESEARCH PROJECTS****Sponsored Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	3D seakeeping computation for conventional and fast hulls	Naval Research Board (DRDO)	
2.	A study on the interaction of surface waves with floating and flexible structures	Naval Research Board (DRDO)	
3.	An Investigation into Geometric Modelling, Design and Analysis of Complex Surfaces	DRDO	
4.	An Investigation into the Hydrodynamic characteristics of Foils with and without Flaps	Naval Research Board (DRDO)	
5.	Development of a coastal wave prediction model utilizing Satellite Data	Space Applications Centre (ISRO)	
6.	Development of a Comprehensive Atlas on Tsunami Travel time and propagation model for Indian Ocean	IIT Kharagpur	
7.	Development of a ship routing code	Space Applications Centre (ISRO)	
8.	Development of an Autonomous Underwater Vehicle	Ministry of Earth Sciences	
9.	Modernization of vibration laboratory	MHRD, New Delhi	
10.	Ship Design for Efficiency and Economy	Ministry of Shipping	
11.	Control of Ballast water problems in ships through design development	Dept. of Shipping	
12.	Estimation of Suspended Sediment Concentrations from Ocean Color Monitor onboard OceanSat and algorithm development for settling velocity	Naval Research Board (DRDO)	
13.	Development of single side single pass submerged arc welding	CSIR, New Delhi	

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|-----|--|--|
| 14. | To develop computer model to predict weld induced residual distortion of large plate panel | DST, New Delhi                           |
| 15. | Development of FRP Roadside Barriers for National Highways                                 | National Highway Authority of India      |
| 16. | Vulnerability Study of Kalpakkam Coast to Marine Hazards                                   | Indira Gandhi Centre for Atomic Research |

**Consultancy Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Com. of linear and 2nd order force on large stationary of floating structures	Indian Register of Shipping	
2.	Design and Development of a Technology Demonstrator 10 metres FOILCAT	NSTL (DRDO)	
3.	Design and Development of Advanced Propulsors for High speed Hybrid Marine Crafts	NSTL (DRDO)	
4.	Design and Development of High speed High breed marine Crafts	NSTL (DRDO)	
5.	Design and Development of Advanced Propulsors for High Speed Marine Crafts	NSTL (DRDO)	
6.	Development of a generic motion equation for a submerged Body	Macmet India Limited	
7.	Development of Auto-algorithm for Submerged Body	Macmet India Limited	
8.	Development of Ship-in-Campus laboratory	Various Marine Engg. Instt. In India	
9.	Software for trajectory simulation of marine vehicles	NSTL (DRDO)	
10.	Hydrodynamic design & design of control surfaces for AUV	NSTL (DRDO)	
11.	Preparation of design, specifications and drawing for vessels of IWAI	Inland Waterways Authority of India	
12.	Development of Software for trajectory simulation of Marine vehicles	NSTL (DRDO)	
13.	Development of a comprehensive Ocean atlas for the Indian Ocean utilizing ARGO data	Indian National Centre for Ocean Information Services	
14.	Operational marine modeling system for Persian Gulf using WAM model	King Fahd University of Petroleum & Minerals, Kingdom of Saudi Arabia	

**VISITS ABROAD BY FACULTY MEMBER**

- |    |                 |   |
|----|-----------------|---|
| 1. | Dr. Ashoke Bhar | Participated ASRAnet – 3 <sup>rd</sup> International Colloquim 2006 at Glasgow, UK., July 10-12, 2006 |
|----|-----------------|---|

#### LECTURE BY VISITING EXPERT

1. Professor Allan Robinson, Harvard University, USA Visited the Department and delivered a talk in July 2006

#### INVITED LECTURES BY FACULTY MEMBERS

1. Prof. Subir Kumar Satsangi Failure Load Estimation for design of Laminated Composite Plates for Ship's (Andhra University, Visakhapatnam)
2. Dr. Prasad K. Bhaskaran Recent Trend in Ocean Wave Modeling Activities (Space Physics Laboratory, Vikram Sarabhai Space Centre (ISRO), Thiruvananthapuram).

#### THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	Ranadev Datta	Development of a B-Spline based method for the 3D forward speed ship motion in Time domain
2.	Saumya Sengupta	Computation of sea-keeping responses of planning hulls in Regular waves
3.	Subhendu Maity	3D linear and nonlinear sea-keeping computations at moderate and high speed
4.	Amit Tyagi	A study on dynamics of underwater vehicles using computational fluid dynamics approach

#### BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	Dr. Prasad K. Bhaskaran	The Indian Ocean Tsunami	Taylor & Francis Group, London, UK	2007

#### PATENTS GRANTED

1. Tsunami Travel Time Prediction using Neural Networks – Copyright Granted
2. A New approach to derive Ocean parameters using Neural Networks – Copyright Granted.

## DEPARTMENT OF PHYSICS & METEOROLOGY

**HEAD : Professor Balbir Kumar Mathur**

### FACULTY

#### Professor :

Basu, Debabrata	Ph.D. (Delhi University), Quantum Field Theory, Group Representations
Chandra, Naresh	Ph.D. (Queens University, UK), Atomic, Molecular, and Optical Physics
Chandrasekar, A.	Ph.D. (IISc Bangalore), Atmospheric Sciences
Choudhary, Ram Naresh Prasad	Ph.D. (Edinburgh, UK), Ferroelectricity, Crystal Structure, Liquid Crystals, Condensed Matter Physics (experimental)
Ghatak, Sobhendu Kumar	Ph.D. (Calcutta University), Condensed Matter Physics, BioPhysics
Ghosh, Timir Baran	Ph.D. (IIT Kharagpur), Vacuum Techniques, Surface Physics, Condensed Matter Physics, Advanced Analytical Techniques
Kumar, Krishna	Ph.D. (IIT Kanpur), Hydrodynamic Instabilities, Pattern-formation and Chaos
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 Kanpur), Nuclear Physics, Semiconductor Physics, Radiation Detection & Measurement
Srinivas, Veeturi	Ph.D. (IIT Bombay), Electronic properties of solids, Magnetic, electrical transport properties, Nanomaterials, 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
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
Konar, Sushan	Ph.D. (RRI Bangalore), Astrophysics
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 Bio-photonics
Shukla, Pragya	Ph.D. (Delhi)
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 :**

**Acharya, H. N.** 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. S. K. Srivastava Assistant Professor

**Faculty Appointed as Emeritus Professor :**

Prof. P. K. Raina	Professor
Prof. Krishna Kumar	Professor
Prof. A. Taraphder	Professor
Dr. P. K. Datta	Associate Professor

**Faculty Retirement :**

Prof. D. Basu Professor

**Faculty Resignation :**

Dr. Sushan Konar                      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 active research in the following areas : Atmospheric Sciences ? mesoscale modeling for tropical weather for tropical weather, Astrophysics & Cosmology, Biophysics & Complex Systems, Chaos & Non-Linear Instabilities, Complexity, Condensed Matter Physics - Superconductive and CMR Materials, Solid State Device Materials, Semiconductor Physics & Nanostructures, Thin Film Growth and Characterization, Sol-gel science, Spintronic Materials, Structure of Matter, surfaces and Interfaces, Non-crystalline alloys, Monte Carlo Simulation, Ferroelectrics, Polymer Nanocomposites, Liquid Crystals, Thermoelectricity. Nuclear, High Energy and Particle Physics, Group Representations, Fiber and Integrated Optics, Optoelectronics, Laser Physics and Non-Linear Optics, Atomic and molecular Physics, UHV applications.

**Thrust Areas :**

1. Condensed Matter Physics
2. Photonics
3. Biophysics
4. Atmospheric Sciences
5. Non-linear Dynamics and complexity
6. Astronomy and Astrophysics
7. Nuclear and Particle Physics

**ON-GOING RESEARCH PROJECTS****Sponsored Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Raman Spectroscopic Studies on Low Dimensional Semiconductor Materials	DST, New Delhi	57.38 Lakhs
2.	Spectroscopic and optical properties of rare earth elements in anionized inorganic oxides	CSIR, New Delhi	6.88 Lakhs
3.	A study of the impacts of initialization of the cyclonic vortex in a high resolution mesoscale tropical cyclone model	DST, New Delhi	14.98 Lakhs
4.	Analysis, Modelling and Design of Semiconductor Optical Amplifier based Photonic Components for Lightwave Systems and Networks	Japan-Indo Collaboration Programme: Kyushu University	20.00 Lakhs
5.	Angle- and spin-resolved photoelectron spectroscopy of atoms and molecules	DST, New Delhi	1.60 Lakhs
6.	Assimilation of satellite data in mesoscale models	Space Application Center, ISRO, Ahmedabad	18.32 Lakhs

7.	Augmentation of the experimental infrastructure in condensed matter physics	DST, New Delhi	65.00 Lakhs
8.	Ceramic Titania Foam	IIT Kharagpur	3.00 Lakhs
9.	Cooperative Phenomenon and nanosize effects in some corelated systems	BRNS	17.56 Lakhs
10.	CRP-Spintronic materials - Simulation and Design of Spintronics Materials	BRNS, DAE	107.30 Lakhs
11.	Design and development of plasma spark sintering facility for nano material compaction	MHRD, New Delhi	20.00 Lakhs
12.	Development and Charaterization of Nanostructured thin films for SiGe Quantum Well Infrared Photodetector and ferroelectric based gas/chemical	DRDO	201.80 Lakhs
13.	Development of all solid state high repetition rate pico- second laser source tunable in wavelength and in pulse duration for nonlinear optical study	DST, New Delhi	55.58 Lakhs
14.	Development of Artificially Structured Nano Magnetic Materials for High Frequency Sensor Applications	DRDO	31.00 Lakhs
15.	Development of cantilever beam magnetometer for in-situ measurement of mechanical and magnetic properties of thin films for spintronic application.	DRDO	68.99 Lakhs
16.	Development of efficient UV laser source for laser induced fluorescence study of malignant tissues	MHRD, New Delhi	10.00 Lakhs
17.	Development of Ion Conducting Polymer-Nanoceramic Surfaces as Templates	CSIR, New Delhi	12.00 Lakhs
18.	Development of microactuators based on shape memory alloy for micro fluidic applications	DRDO	14.71 Lakhs
19.	Development of novel magnetic materials for magnetoelectronic applications	BRNS, DAE	23.00 Lakhs
20.	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	DRDO	73.29 Lakhs
21.	Development of polymer nanocomposite based rechargeble solid-state lithium batteries for ambient and sub-ambient temperature applications	MHRD, New Delhi	15.00 Lakhs
22.	Development of Preform for High Power Fiber Laser	BRNS	24.69 Lakhs
23.	Development of quantum well infrared photodetectors in wavelength range 8-14 um using Si/SiGe nanotechnology	DIT, New Delhi	92.24 Lakhs
24.	Development of terahertz sensors for biomedical imaging and remote detection of chemicals/ biological warfare agents	MHRD, New Delhi	10.00 Lakhs

25.	Electronic properties of highly resistive Al-based quasicrystalline thin films	CSIR, New Delhi	12.00 Lakhs
26.	Experimental Investigations on electronic and thermal transport processes in maganite perovskites and development of various sensing devices	CSIR, New Delhi	7.78 Lakhs
27.	Experimental quadratic cascading for their application in photonic devices	DRDO	23.02 Lakhs
28.	Fabrication of cost-effective AC-magnetic susceptibility measurement set up for use with a liquid nitrogen cryostat assembly down to 70 Kelvin	IIT Kharagpur	3.00 Lakhs
29.	Fabrication of Doped Single-Mode Optical Fibers for Investigation of Bragg Grating Characteristics	DRDO	24.70 Lakhs
30.	Generation of coherent mid-infrared radiation at 16mm through nonlinear optical difference frequency process for application in molecular spectroscop	DAE	30.82 Lakhs
31.	Investigation of nucleation, growth and properties of ultrathin multiplayer films for devices applications	DRDO	328.00 Lakhs
32.	Kinematics of flows in diverse contexts	DST, New Delhi	8.52 Lakhs
33.	Measurement of Casimir force	DRDO	44.64 Lakhs
34.	Measuring the HI power-spectrum with the GMRT	BRNS, DAE	7.73 Lakhs
35.	On some aspects of Nano-photonics	Italian Ministry of Education	12.00 Lakhs
36.	Optical Properties of Fluorescent Nanocrystalline Phosphates and Gallates Co-Doped with transition and rare-earth element	CSIR, New Delhi	7.16 Lakhs
37.	Positron Double-Beta-Decay Processes and Study of Some Fundamental Problems in Neutrino Physics	DST, New Delhi and Italian Ministry of Foreign Affairs	5.00 Lakhs
38.	Preparation & Evaluation of Polymer Nanocomposite Films for Low Temperature Battery Applications	IIT Kharagpur	3.00 Lakhs
39.	Preparation & Evaluation of Thermally Stable Ceramic Materials For Solid Oxide Fuel Cell (SOFC) Applications	MHRD, New Delhi	12.00 Lakhs
40.	R&D in Photonic Crystal Fibers: Design, Fabrication and Experimental Characterization for Applications in Optical Communications and Sensors	DST, New Delhi	30.00 Lakhs
41.	Raman spectroscopic studies of semiconductor nanoparticles prepared by chemical routes	BRNS	6.26 Lakhs



42.	Realization of packet switched node with optoelectronic and photonic technologies for ultra broadband communication systems and networks	Ministry of Education, Italy	0.00 Lakhs
43.	Rural Industrilization of West Bengal	KVIC	60.00 Lakhs
44.	Second order cascaded nonlinear optical processes for all-optical photonic devices	DST, New Delhi	7.62 Lakhs
45.	Spectroscopy of nuclei close to beta-stability line by using complete- and incomplete-fusion and deep-inelastic reactions	DST, New Delhi	13.00 Lakhs
46.	Studies in Photon-Atom and Photon-Molecule Interactions	DST, New Delhi	5.50 Lakhs
47.	Studies in Quantum Information and Spectroscopy Involving Photons, Electrons, Atoms, and Molecules	CSIR, New Delhi	5.50 Lakhs
48.	Studies of Atoms and Molecules in the Presence of External Fields	CSIR, New Delhi	8.00 Lakhs
49.	Studies on Laser-Optical Fiber-Based Micro-Imaging Techniques in the Analysis of Tissue Structure and Detection of Abnormalities	IIT Kharagpur	5.00 Lakhs
50.	Study of Giant magneto-impedance(GMI) in soft ferromagnet for sensor application	CSIR, New Delhi	11.75 Lakhs
51.	Study of magnetic properties of thin films on semiconductor substrates using cantilever beam magnetometer	CSIR, New Delhi and IIT Kharagpur	3.00 Lakhs
52.	Study of single particle and collective degrees of freedom in nuclei at high spin through heavy-ion fusion evaporation reaction mechanism	IIT Kharagpur	2.52 Lakhs
53.	The analysis of Galaxy Redshift Surveys	DST, New Delhi	15.16 Lakhs
54.	To study the effect of interfaces for efficient transport of carriers in organic light emitting materials	CSIR, New Delhi	9.91 Lakhs
55.	Transport properties in organic light emitting materials and role of interfaces for efficient conductions	IIT Kharagpur	3.00 Lakhs
56.	Upgrading Raman spectrometer to microRaman spectrometer to study biomaterials	DRDO	49.80 Lakhs
57.	Z-scan determination of third order optical nonlinearity	IIT Kharagpur	2.00 Lakhs

#### Consultancy Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	High resolution X-ray diffraction	Various agencies	2.00 Lakhs
2.	UV Opacity Evaluation in the samples of cold and anti sun burn cream	DARL, DRDO	0.50 Lakhs

## VISITS ABROAD BY FACULTY MEMBER

1. Prof. Ram Naresh Prasad Choudhary Research (University of Puerto Rico, Sann Juan, USA) May 24 – July 23, 2006
2. Prof. Srinivas, Veeturi To present papers in International conference on materials for advanced technologies (Singapore) July 1-7
3. Dr. Prasanta Kumar Datta Collaboration research project under Inter-Governmental Scientific Cooperation (Department of Physics, Sofia University, Sofia, Bulgaria) June 18-27, 2007
4. Dr. Prasanta Kumar Datta Japan-Indo Collaboration Project (Department of Electric, Electronics and Information Engg, Osaka University, Japan) June 29 – July 3, 2007
5. Dr. Prasanta Kumar Datta To present the progress of Japan-Indo Collaboration project in second Forum Meeting (Kyushu University, Fukuoka, Japan) July 4-5, 2007
6. Dr. Prasanta Kumar Datta To present a paper in Japan-Indo Workshop on Microwaves, Photonics and Communication Systems (Kyushu University, Fukuoka, Japan) July 6-7, 2007
7. Dr. Prasanta Kumar Datta Japan-Indo Collaboration Project (Department of Electric, Electronics and Information Engg, Osaka University, Japan) December 12-17, 2006
8. Dr. Prasanta Kumar Datta To present the progress of Japan-Indo Collaboration project in first Forum Meeting (Gakushi-Kaikan, Tokyo, Japan) December 9-11, 2006
9. Prof. Samit Kumar Ray Visiting Professor (Tokyo Institute of Technology, Japan) May 1 - June 30
10. Prof. Samit Kumar Ray Paper presentation in International conference (Singapore) 5 days
11. Prof. Shivcharan Lal Sharma To participate and present five research papers in 2006 IEEE NSS / MIC / RTSD (San Diego, California, USA) October 10 – November 3, 2006
12. Prof. Shivcharan Lal Sharma To visit labs (Department of Nuclear Engineering & Radiological Sciences, Michigan University, USA) November 6-7, 2006
13. Prof. Shivcharan Lal Sharma Personal visit (Dr. R. N. Bharadwaj, 3900 Meadowbrook Drive, Michigan) November 4-11, 2006
14. Dr. Amal Kumar Das Scientific collaboration (Jaharnes Kepler University (JKU), Linz, Austria) 2 months
15. Prof. Arghya Taraphder To present a paper (Max Planck Institute, Dresden, Germany) February 26 – March 3, 2007

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|-----|----------------------------|--|
| 16. | Prof. Arghya Taraphder     | For scientific collaboration (Max Planck Institute, Dresden, Germany) May - July 2007  |
| 17. | Prof. Prabhu Krishna Raina | Meetings and Discussions under Indo Italian Collaboration Program. (LNGS and University of Roma II "Tor Vergata", Italy) 10 days in October 2006 |

#### INVITED LECTURES BY FACULTY MEMBERS

- |     |                                   |   |
|-----|-----------------------------------|---|
| 1.  | Prof. Ram Naresh Prasad Choudhary | Design and development of advanced materials for devices (T.M. Bhagalpur University, Bihar)   |
| 2.  | Prof. Ram Naresh Prasad Choudhary | Multifunctional Materials : Design, Development and Devices (Guru Ghasidas University, Bilaspur)  |
| 3.  | Dr. Achintya Dhar                 | GISAXS and its applications (Department of Physics, NIT, Rourkela)  |
| 4.  | Dr. Achintya Dhar                 | Nanomaterials : Synthesis, Properties and Applications (School of Materials Science & Technology, Jadavpur University)  |
| 5.  | Prof. A. Chandrasekar             | Mesoscale modeling of cyclones and 3DVAR assimilation studies over India (Andhra University, Visakhapatnam)   |
| 6.  | Prof. A. Chandrasekar             | Assimilation of satellite and conventional obs. for improving simulation of meteorological systems (Department of Earth Sciences, Government of India, New Delhi) |
| 7.  | Prof. A. Chandrasekar             | Meteorological Modeling (University of Utkal, Bhubhaneshwar, Orissa)  |
| 8.  | Dr. Sayan Kar                     | Quantum mechanics in volcano potentials (IUCAA, Pune)   |
| 9.  | Dr. Somnath Bharadwaj             | Cosmology (JBNSTS, Kolkata)   |
| 10. | Dr. Prasanta Kumar Datta          | Photonics activity at IIT Kharagpur (Vigyan Bhawan Annex, New Delhi)  |
| 11. | Dr. Prasanta Kumar Datta          | SOA based wavelength converter using FWM for DPSK signaling (Gakushi-Kaikan, Tokyo, Japan)  |
| 12. | Dr. Prasanta Kumar Datta          | Modelling and Characterization of a semiconductor optical amplifier (Department of Electric, Electronics and Information Engineering Osaka University, Japan)     |
| 13. | Dr. Prasanta Kumar Datta          | Modelling and Characterization of a semiconductor optical amplifier (Kyushu University, Fukuoka, Japan)   |
| 14. | Dr. Prasanta Kumar Datta          | Role of inverse loss saturation in nonlinear mirror mode-locking (Kyushu University, Fukuoka, Japan)  |

15. Dr. Prasanta Kumar Datta      Ultrashort optical pulse generation and characterization (National Institute of Materials Science, Tsukuba, Japan)
16. Dr. Prasanta Kumar Datta      Ultrafast tunable optical pulse generation (IIT Madras)
17. Dr. Prasanta Kumar Datta      Development and stability study of Nonlinear mirror mode-locked laser (Department of Electric, Electronics and Information Engineering, Osaka University, Japan)
18. Dr. Prasanta Kumar Datta      Generation and characterization of ultrashort laser pulse (Raja Ramanna Centre for Advanced Technology, Indore)
19. Dr. Prasanta Kumar Datta      Second order cascaded nonlinear optical processes for mode-locking a laser (Department of Physics, Sofia University, Sofia, Bulgaria)
20. Prof. Samit Kumar Ray      Group-IV semiconductor nanostructures for device applications (Tokyo Institute of Technology)
21. Prof. Samit Kumar Ray      Ge nanostructures for electronic & optical devices (Raja Ramanna Centre for Advanced Technology, Indore)
22. Prof. Samit Kumar Ray      Self-assembled Ge Islands for Silicon Based Nanoscale Devices (Jadavpur University)
23. Prof. Samit Kumar Ray      Nanostructured Semiconductors (SGITS, Indore)
24. Prof. Samit Kumar Ray      MBE Growth of Strained Layer SiGe Heterostructures & Self-assembled Ge Islands (Kolkata)
25. Dr. Anushree Roy      Visible Raman Spectrum as a Fingerprint to Characterize Hydrogenated Diamond-like-carbon Films (Saha Institute of Nuclear Physics, Kolkata)
26. Prof. Krishna Kumar      Patterns in Faraday experiment (IACS, Kolkata)
27. Dr. Awalendra Kumar Thakur      Development and Evaluation of Solid State Polymer Batteries (G. G. University, Bilaspur)
28. Prof. Naresh Chandra      Generation and Characterization of Pairs of Flying Electrons with Tunable Degree of Entanglement (IIT Chennai)
29. Prof. Arghya Taraphder      Colossal magnetoresistive manganites (IIT Kanpur)

## THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	Ratna Koley	Studies on Aspects of Gravity and Geometry in Dimensions D # 4
2.	Biswajit Pandey	A Two-Dimensional Study of Filamentarity in Galaxy Redshift Surveys
3.	Sourabh Mukhopadhyay	Development and Stability Study of Nonlinear Mirror Mode-Locked Laser
4.	Achintya Singha	Spectroscopic Studies on Low Dimensional Systems
5.	Susanta Kumar Das	Studies on Nonlinear Optical Materials and Processes for Efficient Photonic Devices

## LAURELS & DISTINCTIONS

1.	Prof. A. Chandrasekar	Best Poster Award in National Conference TROPMET 2006 at Indian Institute of Tropical Meteorology, Pune (2006)
2.	Prof. Ram Naresh Prasad Choudhary	Best Poster Award in NSFD XIV Effect of La/Mn .....multiferroics (2006)
3.	Prof. Ram Naresh Prasad Choudhary	Honoured by NSFD XIV for outstanding contributions in the area of Ferroelectrics and Dielectrics
4.	Prof. Samit Kumar Ray	Best paper award in national review and coordination meeting on nanoscience and nanotechnology (2007)
5.	Prof. Samit Kumar Ray	Member, National Technical Committee on Nanotechnology - Bureau of Indian Standards (2006)

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

1. 14th National seminar on ferroelectrics and dielectrics (NSFD)
2. Correlated electronic systems and novel materials
3. DAE-BRNS Symposium on High Energy Physics, 2006
4. National workshop on Advances in Multifunctional Materials
5. National workshop on Roadmapping process of Advanced Heterostructures
6. XVII DAE BRNS High Energy Physics Symposium

# **RESEARCH PUBLICATIONS**

## DEPARTMENT OF AEROSPACE ENGINEERING

### RESEARCH PUBLICATIONS

#### Journals :

1. Datta, P. K., Srivastava, A.K.L. and Sheikh, A.H., "Effect of Configuration and Stiffener Length on Vibration and Dynamic Instability", *Advances in Vibration Engineering*, vol. 5, no. 3, pp. 207-220, 2006
2. Datta, P.K., and Pradhan, Sumeet, "Dynamic Instability Characteristics of a free-free missile structure under a controlled follower force", *International Journal of Aircraft Engineering and Aerospace Technology*, 78 (6), pp.509-514, 2006, Emerald
3. Datta, P.K., and Ratnakar, S. Udar, "Parametric combination resonance instability characteristics of laminated curved panels with circular cutout subjected to non-uniform loading with damping", *International Journal of Mechanical Sciences*, vol. 49, 2007, pp. 317-334, Elsevier
4. Datta, P.K., and Ratnakar, S. Udar, "Dynamic combination resonance characteristics of doubly curved panels subjected to non-uniform tensile edge loading with damping", *Int. J. Structural Engineering and Mechanics*, vol. 25, no. 4, March 2007, pp.481-500, Techno-Press
5. Datta, P.K. and Sahu, S. K., "Research Advances in the Dynamic Stability Behaviour of Plates and Shells: 1987-2005 Part 1 : Conservative Systems" *Applied Mechanics Reviews*, ASME, vol. 60, March 2007, pp.65-75
6. Datta, P.K., and Ratnakar, S. Udar, "Dynamic analysis of parametrically excited laminated composite curved panels under non-uniform edge loading with damping", *Composite Structures*, vol.79, 2007, pp.356-368, Elsevier
7. Mitra S., Kumar A., and Sinhamahapatra K. P., A Fluid-Solid Finite Element Method for the Analysis of Reactor Safety Problems, *Annals of Nuclear Energy*, 33, 8, pp. 692-699, 2006
8. Mitra S. and Sinhamahapatra K. P., Slosh dynamics of liquid filled containers with submerged components using pressure based finite element method, *Journal of Sound and Vibration*, vol. 304, 1-2, pp 361-381, 2007
9. Singh S., Sinhamahapatra K. P., and Mukharjea S. K. Control of separation and vortex shedding from a bluff body using imposed magnetic field, *ASME Journal of Fluids Engineering*, vol. 129, No. 5, pp. 517-523, 2007
10. Tripathi V., Singh, B. N., and Shukla K. K "Free Vibrations of laminated Composite Conical shells with random material properties" *Composite Structures*, 81, 96-104, 2007
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## DEPARTMENT OF AGRICULTURAL & FOOD ENGINEERING

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## DEPARTMENT OF CHEMISTRY

### RESEARCH PUBLICATIONS

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#### Seminars / Workshops / Conferences :

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## DEPARTMENT OF CIVIL ENGINEERING

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38. Performance and correlation of sludge age and efficiency of UASB reactor during step increase in loading rates *By* Ghangrekar M.M. *Institution of Engineers (India), Environmental Engineering Division* 87, 8-15 (2006)
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44. Required minimum granule size in UASB reactor and characteristics variation with size. *By* Puspendu Bhunia and M.M. Ghangrekar *Bioresource Technology* 98, 994-999 (2007)
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49. Source apportionment of PM10 at residential and industrial sites of an urban region of Kolkata, India *By* Kakoli Karar, A. K. Gupta *Atmospheric Research* 84(1), 30-41 (2007)
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52. The Extremal Index and the Maximum of a Dependent Stationary Pulse Load Process Observed above a High Threshold *By* Bhattacharya, B. *Structural Safety* (2007)

53. Theory of free surface flow over rough seeping beds *By Bose S K and Dey S Proceedings of Royal Society A, London Vol.463, pp. 369-383 (2007)*
54. Valuing Attributes of Enhanced Traffic Information: An Experience in Kolkata *By Basu. D., and Maitra, B. Transport 22(3) (2007)*
55. Valuing Attributes of Rural Feeder Service to Bus Stop *By Das, S. S., Maitra, B., and Boltze, M. Indian Highways, IRC 35(5), 9-16 (2007)*
56. Valuing Attributes of Traffic Information by Taxi Users: A Comparison between Multinomial and Mixed Logit Techniques *By Basu, D., and Maitra, B. Highway Research Bulletin, IRC In Press (2007)*
57. Valuing Travel Time and its Variation Level Projected as Traffic Information on a Roadside VMS Board: A SP Approach *By Basu, D., Maitra, B. International Journal of Transport Economics 34(2), 225-243 (2007)*
58. Women in Engineering in India *By Goel, Sudha The International Journal of Interdisciplinary Social Sciences 1(6):49-55 (2006)*

#### **Seminars / Workshops / Conferences :**

1. Geometrically nonlinear free flexural vibrations of composite cylindrical shells with cutouts, *By Namita Nanda and JN Bandyopadhyay, ICCMS-06, IIT Guwahati, (2006)*
2. Nonlinear dynamic response of laminated composite shells, *By Namita Nanda and JN Bandyopadhyay, RACE-07, CET Bhubaneswar, (2007)*
3. Static and Free Vibration Analysis of Laminated Conoids Using a Higher-Order Theory", *By S. Pradyumna and JN Bandyopadhyay, ICCMS-06, IIT Guwahati, (2006)*
4. A general doubly curved element for bending and free vibration analysis of multilayered composite shell dishes, *By Latifa Sk., S. J. Hossain and Sinha, International Congress on Computational Mechanics and Simulation (ICCMS), I.I.T, Kanpur, India, (2004)*
5. A geometrically exact shell model for the analysis of flexible hinges, *By S. J. Hossain, Latifa Sk. and Sinha, P.K, International Conference on Composite and Structural Integrity (ICASI'04 & XIII NASAS), IISc, Bangalore, India, (2004)*
6. A New Element Based on Koiter's Shell Theory with Shear Deformation for Laminated Composite Shells, *By S. J. Hossain, P.K. Sinha and A.H. Sheikh, International Conference on Theoretical, Applied, Computational and Experimental Mechanics (ICTACEM), Indian Institute of Technology, KGP, (2001)*
7. A refined finite element analysis of laminated piezothermoelastic composite shells, *By S. J. Hossain, Latifa Sk and P.K. Sinha, Second ISAMPE National Conference on Composites (INCCOM-2), Twelfth National Seminar on Aerospace Structures (XII NASAS), Indian Institute of Science, Bangalore, (2003)*
8. An Investigation on the effect of coarse aggregate shape on the performance of bituminous mixes, *By Uday Sankar; Amar Kumar; M. Amaranath Reddy ;K. Sudhakar Reddy, International Seminar on Innovations in Construction and maintenance of flexible pavements, Agra, (2006)*
9. Anisotropic undrained shear strength from back analysis, *By Singh, R., and Roy, D., 59th Canadian Geotech. Conference, Vancouver, British Columbia, (2006)*
10. Application of microbial fuel cell for wastewater treatment and coincident direct electricity recovery., *By Sridhar P. and Ghangrekar M.M., International conference on cleaner technologies and environmental management, Pondicherry Engineering College, India, (2007)*

11. Analysis of functionally graded plates and shells, *By S.Pradyumna and JN Bandyopadhyay, RACE07, CET Bhubaneswar, (2007)*
12. Back-calculation of Concrete Pavement Modulus and PCN Evaluation Using FWD Data, *By S.K. Tiwari and K. Sudhakar Reddy, International Conference on Civil Engineering in the New Millennium Opportunities and Challenges, BES University, Shibpur, (2007)*
13. Choice of scaling parameter in Meshless Petrov-Galerkin (MLPG) Method, *By P. Pal & S. K. Bhattacharyya, International conference on Computational Mechanics & Simulation, IIT Guwahati, (2006)*
14. Conceptual Framework for Qualitative Construction Site Assessment System, *By Tarun Bhambra and S V Barai, International Conference on Civil Engineering in the New Millennium: Opportunities and Challenges, BESU, Shibpur, (2007)*
15. Correlation for Earthquake-related Deformation of Embankments, *By Das, D., Singh, R., and Roy, D., 4th International Conference on Earthquake Geotech. Engrg., Thessaloniki, Greece, (2007)*
16. Design of earth dams and embankments for earthquakes, *By Roy, D., and Jain, S.K., 6th International R&D Conference, Lucknow, (2007)*
17. Development of Neural Networks Model for Predicting the Properties of Concrete Mix, *By Chandan Mishra and S V Barai, International Conference on Civil Engineering in the New Millennium: Opportunities and Challenges, BESU, Shibpur, (2007)*
18. Dynamic analysis of a liquid storage tank under sinusoidal base excitation, *By P. R. Maity, S. K. Bhattacharyya & S. Majumdar, Tenth East Asia Pacific Conference on Structural Engineering & Construction, Bangkok, Bangkok, (2006)*
19. Effect of Age Hardening and Segregation on Top Down Cracking in Bituminous Pavements, *By Sridhar R, S. Satya Kumar, Dr. Sunil Bose and K. Sudhakar Reddy, International Seminar on Innovations in Construction and Maintenance of Flexible Pavements, Agra, (2006)*
20. Effect of Tree Structure on Nested Logit Model for Choice of Rural Feeder Service to Bus Stop, *By Das, S. S., and Maitra, B., Civil Engineering in the New Millennium: Opportunities and Challenges, Bengal Engg. and Sci.Univ., Shibpur, (2007)*
21. Estimation of embankment deformation caused by earthquakes, *By Das, D., Singh, R., and Roy, D., CENeM-2007, Bengal Engineering and Science Univ, (2007)*
22. Estimation of Permanent Deformation of Tehri Dam due to 7.0 and 8.5 Magnitude Earthquakes, *By A. Sengupta, Advances in Earth Structures, ASCE, Geotechnical Special Publications No. 151, Shanghai, China, (2006)*
23. Evaluating an Enhanced Travel Time Description as Traffic Information on Route Choice Behavior of Taxi Users in Kolkata, *By Basu, D. Maitra, B., Civil Engineering in the New Millennium: Opportunities and Challenges, Bengal Engg. and Sci. Univ., Shibpu, (2007)*
24. Experimental Investigation of Notched Mild Steel Beams Subjected to Low Velocity Impact, *By Rajendrakumar Harsoor and Ramachandra, L.S., 8th International Conference and Vibration Problems, BESU, Shibpur, Kolkata, (2007)*
25. Experimental Studies on Rubber Fiber Based Concrete, *By K S Malladi and SV Barai, The Tenth East Asia-Pacific Conference on Structural Engineering and Construction (EASEC-10), Bangkok, Thailand, (2006)*
26. Finite Element analysis of contained fluid under external excitation, *By P. R. Maiti & S. K. Bhattacharyya, International Conference on Computational Mechanics & Simulation, IITY Guwahati, (2006)*
27. Finite element analysis of laminated composite shells using consistent shear correction factors, *By S.J. Hossain and P.K. Sinha, Structural Engineering Convention, An International Meet (SEC), Indian Institute of Technology Kharagpur, (2003)*

28. Flow characteristics over gravel-beds at near-threshold, *By Dey S and Raikar R V, Second International Conference on Application of Fluid Mechanics in Industry and Environment*, ISI, Kolkata, (2006)
29. Fluoride in Drinking Water: A Global Perspective, *By A K Gupta and S. Ayoob, 94th Indian Science Congress*, Annamalainagar, Chidambaram, (2007)
30. Free Vibration Analysis of Rectangular Plate on Elastic Half- space by BE-FE Coupling Approach, *By J.J.Mandal & D.P.Ghosh, CE-NeM -2007*, BE-College, Sibpur, Howrah, (2007)
31. Health Risk Assessment for a contaminated site: a case study, *By Goel, Sudha, National Conference on Environmental Pollution and Health: problems and solutions*, New Delhi, (2007)
32. Holistic environmental education through sustainable habitats, *By V. R. Desai, Environmental Science and Technology - 2006*, Houston, Texas, USA, (2006)
33. Interface Behavior in Concrete Pavement, *By Maitra, S.R., Reddy, K.S. and Ramachandra, L.S., Proc. of 2nd International Congress on Computational Mechanics and Simulations*, Guwahati, (2006)
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35. Load Transfer in Dowel-Jointed Concrete Pavement, *By Maitra, S.R., Reddy, K.S. and Ramachandra, L.S., Proc. of the International Conference on Civil Engineering in New Millennium*, Bengal Engineering and Science Universit, (2007)
36. Looking Back at Pekeris Problem, Key Note Paper, *By R. Tarafdar and S P Dasgupta, Civil Engineering in the New Millennium: Opportunities and Challenges*, B E College, Howrah, (2007)
37. Low Cost Performance Evaluation of Rural Roads, *By U.C.Sahoo and K.S Reddy, National Conference on Recent Advances on Civil Engineering*, CET, Bhubaneswar, (2007)
38. Measuring bacterial regrowth potential for a drinking water utility, *By Goel S, and Bower EJ, CENeM2007*, Shibpur, West Bengal, (2007)
39. Modelling Load Transfer in Dowel-jointed Concrete Pavement, *By Maitra, S.R., Reddy, K.S., Ramachandra, International Conference on Civil Engineering in the New Millenium: Opportunities and Challenges*, B.E. College, Shibpur, Kolkata, (2007)
40. Neural Network Models for Air Quality Prediction: A Comparative Study, *By S V Barai, A K. Dikshit, and Sameer Sharma, 11th Online World Conference on Soft Computing in Industrial Applications (WSC11)*, World Wide Web, (2006)
41. Non-linear sloshing of liquid in a container using Meshless local Petrov-Galerkin (MLPG) approach, *By P. Pal and S. K. Bhattacharyya, International conference in New Millenium*, Bengal Engg. & Sc. University, Shibpur, (2007)
42. Optimizing Generalized Cost of Travel: An Approach for Improvement Planning of Rural Bus Service, *By Pal, S., Phani Kumar, C. V., and Maitra, B., Civil Engineering in the New Millennium: Opportunities and Challenges*, Bengal Engg. and Sci. Univ., Shibpu, (2007)
43. Pavement Temperature Effect on Initiation of Top- Down Cracking, *By Sridhar R, K. Sudhakar Reddy, Sunil Bose and B.B. Pandey, Trends in Road Making Materials, Methods & Machinery - for quality, Economy & Speed*, Bhopal, (2007)
44. Performance Criteria for design of low volume roads, *By Umesh Sahoo, M. Amaranath Reddy and K. Sudhakar Reddy, Nataional Conference on Rural roads*, Vignan Bhavan, New Delhi, (2007)

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46. Performance of active tendon system in soil-structure-interaction model, By Nirjhar Dhang and S. K. Singh, *International Conference on Civil Engineering in the New Millennium "Opportunities and Challenges"*, BESU, Sibpur, (2007)
47. Probability-based vulnerability and criticality assessment of a highway bridge subjected to terrorist attack, By Michelle T. Bensi and Baidurya Bhattacharya, *10th International Conference on Applications of Statistics and Probability in Civil Engineering (ICASP10)*, Tokyo, Japan, (2007)
48. Qualitative Construction Site Assessment System (QCSAS) Using Information Communication Technology (ICT), By Tarun Bhambra and S V Barai, *Sixth Asia Pacific ABC Conference*, IIM Ahemedabad, (2006)
49. Relationship between undrained shear strength and SPT blow count, By Roy, D., and Singh, R., *Indian Geotechnical Conference*, Chennai, (2006)
50. Reliability-based bridge rating using in-service loading data in the presence of corrosion deterioration, By Baidurya Bhattacharya, *Civil Engineering in the New Millenium*, Shibpur, WB, (2006)
51. Settlement of Ring Foundations, By Baidya, D. K., *CENeM-2007*, Bengal Engineering and Science University, (2007)
52. Sewage reuse for aquaculture after treatment from oxidation and duckweed pond., By Ghangrekar M. M, Arunabha Mitra, Nand Kishor, *7th IWA Specialist Group Conference on Waste Stabilization Ponds Advances in Pond Technology and Management*, AIT, Bangkok, Thailand, (2006)
53. Shape and size controlled synthesis of gold nanoparticles in TX-100 medium via controlled nucleation using a bioactive molecule, By Anjali Pal, *Eighth International Conference on Nanostructured Materials (NANO-2006)*, Indian Institute of Science, Bangalore, (2006)
54. Site Specific Study of Lanta Khola Slide in Sikkim Himalaya, By A. Sengupta, *International Disaster Reduction Conference (IDRC)*, Switzerland, (2006)
55. Sloshing Response in a container under base excitation, By P. R. Maiti & S. K. Bhattacharyya, *International conference on 'Civil Engineering in New Millenium'*, Bengal Engg. and Sc. University, Shibpur, (2007)
56. Spatial Quantitative Approach for Assessment of Impacts on Water Quality Due to Highway Development Project, By Agrawal, M.L. Maitra, B., and Ghose, M.K., *Civil Engineering in the New Millennium: Opportunities and Challenges*, Bengal Engg. and Sci. Univ., Shibpur, (2007)
57. Studies on Fly Ash Based Self-Compacting Concrete, By H S Narashimhan and S V Barai, *The Tenth East Asia-Pacific Conference on Structural Engineering and Construction (EASEC-10)*, Bangkok, (2006)
58. Subgrade Characterization For Mechanistic Evaluation Of In-Service Rural Roads, By UC Sahoo and K. Sudhakar Reddy, *National Conference on Rural Roads*, Vigyan Bhawan, New Delhi, (2007)
59. Suppression of liquid sloshing using baffles, By S. K. Bhattacharyya, *International conference on Computational Mechanics*, IIT Guwahati, (2006)
60. The asymptotic properties of strength and compliance of single-walled carbon nanotubes containing random defects, By Baidurya Bhattacharya and Qiang Lu, *10th International Conference on Applications of Statistics and Probability in Civil Engineering (ICASP10)*, Tokyo, Japan, (2007)

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62. Treatment of sewage in modified anaerobic baffled reactor and UV disinfection for onsite sanitation., *By* Ghangrekar M.M. and Chadra Kiran P., *An international perspective on environmental and water resources. Conference organized by ASCE*, New Delhi, India, (2006)
63. Turbulent flow in submerged jumps on rough beds, *By* Dey S and Sarkar A, *Second International Conference on Application of Fluid Mechanics in Industry and Environment*, ISI, Kolkata, (2006)
64. Vertical vibration of a full scale single bored pile - Testing and analysis, *By* Manna, B and Baidya, D. K., *12th Int Assoc for computer methods and advances in Geomechanics (accepted)*, Goa, India
65. Vertical Vibration of Foundations Resting on Layered Soil”, *By* P.K.Pradhan, D.K.Baidya & D.P. Ghosh, *“New developments in Geoenvironmental & Geotechnical Engineering”*, University of Incheon, Incheon, S.Korea, (2006)
66. Very large floating structures, *By* H. Suzuki, H. R. Riggs, M. Fujikubo, T. A. Shugar, H. Seto, Y. Yasuzawa, B. Bhattacharya, D. A. Hudson, H. Shin., *26th International Conference on Offshore Mechanics and Arctic Engineering*, San Diego, CA, USA, (2007)



## DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

### RESEARCH PUBLICATIONS

#### Journals :

1. A co-processor for computing the Euler number of a binary image using divide-and-conquer strategy By S. Dey, B. B. Bhattacharya, M. K. Kundu, A. Bishnu, and T. Acharya *Fundamenta Informaticae* 76(1-2), pp. 75-89 (2007)
2. A Fast Arbitrary Factor Video Re-sizing Algorithm By V. Patil, R. Kumar and J. Mukherjee *IEEE trans. on Circuits Systems and Video Technology* 16, 1164-1171 (2006)
3. A flexible contention resolution scheme for QoS provisioning in optical burst switching networks By Ashok Turuk and Rajeev Kumar *Computer Communications* 29 (12) : 2361–237 (2006)
4. A parallel algorithm for dynamic slicing of distributed Java programs in non-DSM systems By DP Mohapatra, Rajib Mall and Rajeev Kumar *Int. J. Information & Communication Technology* 1(1): 38 - 49 (2007)
5. A Rule-Based and Game Theoretic Approach for Credit Card Fraud Detection By Batsa, Vishal, Sural, Shamik, and Majumdar, A. K. *Journal on Information Security and Privacy* 1(3), pp. 26-46 (2007)
6. A System for Automatic Evaluation of 'C' Programs - features and interfaces By Amit Mandal, C Mandal, Chris Reade *International Journal of Web-Based Learning and Teaching Technologies* 2(4), 24-39 (2007)
7. An Efficient Interprocedural Dynamic Program Slicing Method By G.B. Mund and R. Mall *Journal of Systems and Software* 79(6), 791-806 (2006)
8. An efficient motion vector composition scheme for arbitrary frame down-sampling video transcoder By Rajeev Kumar and Vasant Patil *IEEE Transactions on Circuits and Systems for Video Technology* 16(9): 1148 - 1152 (2006)
9. An Efficient Scan Tree Design for Compact Test pattern Set By S. Banerjee, D.Roy Chowdhury and B. B. Bhattacharya *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, July 2007* V 26(7), pp1331-1339 (2007)
10. An Evolutionary Algorithm based approach to Automated Design of Analog and RF circuits using Adaptive Normalized Cost Functions By A. Somani, P. P. Chakrabarti, A. Patra *IEEE Transactions on Evolutionary Computing* 11(3), pp 336-353 (2007)
11. An overview of slicing techniques for object-oriented programs By DP Mohapatra, Rajib Mall and Rajeev Kumar *Informatica* 30 (2) : 253 - 277 (2006)
12. Automatic Test Case Generation from UML Communication Diagrams By Philip Samuel, Rajib Mall and Pratyush Kanth *Information and Software Technology* 49(2), 158-171 (2007)
13. Design Benchmarking, User Behavior Analysis, and Link-Structure Personalization in Commercial Web Sites By M. Jenamani, Pratap K. J. Mohapatra and S. Ghose *Electronic Networking Applications and Policy* 16, no. 3, 248-266 (2006)
14. BUSpec: A Framework for Generation of Verification Aids for Standard BUS protocol specifications By B.Pal, A.Banerjee, P.Dasgupta, P.P.Chakrabarti *Integration -- The VLSI Journal* 30 (3), 285-304 (2006)
15. Database Intrusion Detection using Weighted Sequence Mining By Srivastava, Abhinav, Sural, Shamik and Majumdar, A. K. *Journal of Computer* 1(4), pp 8-17 (2006)

16. Design Intent Coverage – A new paradigm for Formal Property Verification *By* P. Basu, S.Das, A.Banerjee, P.Dasgupta, P.P.Chakrabarti, C.R.Mohan, L.Fix, R.Armoni *IEEE Transactions on CAD* 25 (10), 1922-1934 (2006)
17. Diagnosis of Delay-Deadline Failures in Real Time Discrete Event Models *By* Santosh Biswas, Dipankar Sarkar, Prodip Bhowal and Siddhartha Mukhopadhyay *Proc. Of ISA Transactions* In Press (2007)
18. Distributed Dynamic Slicing of Java Programs *By* D. Mahapatra, R. Kumar, R. Mall, D.S. Kumar, and M. Bhashin *Journal of Systems and Software* 79( 12), 1661-1678 (2006)
19. Emergence of a non-scaling degree distribution in bipartite networks: a numerical and analytical study *By* Peruani, F., Choudhury, M., Mukherjee, A., and Ganguly, N *Euro. Phys. Letters* (2007)
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## DEPARTMENT OF ELECTRICAL ENGINEERING

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## DEPARTMENT OF ELECTRONICS & ELECTRICAL COMMUNICATION ENGINEERING

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## DEPARTMENT OF GEOLOGY & GEOPHYSICS

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## DEPARTMENT OF MINING ENGINEERING

### RESEARCH PUBLICATIONS

#### Journals :

1. Analysis of Sinkhole Occurrences over Abandoned Mines Using Fuzzy Reasoning: A Case Study By Deb D and S.O. Choi *Journal of Geological & Geotechnical Engineering* Vol. 24, pp. 1243-12 (2006)
2. Application of statistical quality control for limestone grade: a case study By Bhattacharya, J., Islam, M., Kumar, A., Santosh, G. *Mining Technology* Volume 116, Number 1 (2007)
3. ARD generation and corrosion potential of exposed roadside rockmass at Boeun and Mujoo, South Korea By Ji, S.W., Cheong, Y.W., Yim, G.J., Bhattacharya, J. *Environmental Geology* 52 (6), pp. 1033-104 (2007)
4. Efficacy of Numerical Analysis on Stability of Stope Applying Three Dimensional Finite Element Method For A Chromite Ore Body. By Dr. D. Deb and Dr. S. K. Mukhopadhyay *Transaction Journal of the Mining, Geological & Metallurgical Institute of India* vol.103, pp.83-93. (2007)
5. Face Stability Index (FSI): An approach for Longwall Powered Support Pressure Estimation By Verma A.K. and D. Deb *Journal of Mines, Metals & Fuels* Vol. 54, No. 12, pp. (2006)
6. Fault tree analysis of a coal handling plant in Mahanadi Coalfields Ltd - Evolution of a maintenance management tool By Bhattacharya, J., Gupta, S., Saha, R. *Journal of Mines Metals and Fuels* 52 (11), pp. 305-313 (2006)
7. Forecasting Shield Pressures at a Longwall Face Using Artificial Neural Networks By Deb D, A. Kumar and R.P.S. Rosha *Journal of Geological & Geotechnical Engineering* Vol.24, No. 4, pp. 1 (2006)
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108. Synthesis and multiferroic characteristics of Ni-PVDF nanocomposite, *By* M.Panda, A.K. Thakur and V. Srinivas, *International Conference on Materials for Advanced Technologies*, Singapore, (2007)
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# **PART-III**

## **STATISTICAL INFORMATION**

**Table A-3**

DISCIPLINE-WISE BREAK-UP OF STUDENTS AWARDED M.C.M. SCHOLARSHIP 2006-2007  
Rate of Scholarship : Rs.1000/- p.m. plus Free-tuition ship

#	Course	1 <sup>st</sup> yr.	2 <sup>nd</sup> yr.	3 <sup>rd</sup> yr.	4 <sup>th</sup> yr.	5 <sup>th</sup> yr.	Total
<b>(A) B.Tech. 4-Year</b>							
1	Aerospace Engg.	7	7	5	2		21
2	Agri. & Food Engg.	3	5	2	3		13
3	Biotech. & Bioch. Engg.	5	5	4	1		15
4	Chemical Engg.	10	7	3	10		30
5	Civil Engg.	9	8	6	4		27
6	Computer Sc. & Engg.	8	14	10	7		39
7	Electrical Engg.	12	18	11	5		46
8	Electronics & ECE	15	13	2	7		37
9	Energy Engg.	4	4	1	3		12
10	Industrial Engg.	3	2	3	2		10
11	Instrumentation Engg.	8	5	5	5		23
12	Manuf. Sc. & Engg.	2	5	4	7		18
13	Mechanical Engg.	14	14	10	8		46
14	Met. & Mat. Engg.	10	6	5	3		24
15	Mining Engg.	10	5	5	4		24
16	Ocean Engg. & N.A.	5	5	5	6		21
<b>(B) B.Arch. 5-Year</b>							
	Architecture	3	5	2	3	5	18
<b>(C) M.Sc. Integrated 5-Year</b>							
1	Applied Geology	4	-	2	3		9
2	Economics	5	1	-	-		6
3	Expl. Geophysics	1	2	5	2	2	12
4	Industrial Chemistry	1	2	5	4	3	15
5	Maths. & Computing	7	8	6	4	6	31
6	Physics	7	2	1	5		15
7	Statistics & Informatics	6	7	-	-		13
<b>(D) M.Sc. 2-Year</b>							
1	Chemistry	11	13				24
2	Geophysics	4	-				4
3	Geological Sciences	2	5				7
4	Mathematics	8	7				15
5	Physics	10	14				24
6	Statistics & Informatics	2	8				10
<b>(E) Dual Degree 5-Year</b>							
1	Aerospace Engg.	5	3	4	2	-	14
2	Ag. & F. E./ Water Res. Dev. & Manag.	4	1	2	2	-	9
3	Biotech. & Bioch. Engg.	6	1	3	2	-	12
4	Chemical Engg.	3	6	3	1	-	13
5	Civil Engg./Struct. Engg.	2	3	-	1	-	6
6	Computer Sc. & Engg./Comp. & Information Technology	5	1	4	7	-	17
7	Electrical Engg./Instrumentation Engg.	4	3	3	3	-	13
8	E & ECE/Automation & Comp. Vision	9	6	1	3	-	19
9	Industrial Engg./IEM.	2	2	3	1	-	8
10	Manuf. Sc.& Engg./IEM	2	3	2	1	-	8
11	M.E./M.S. Engg.						
12	M.E./Thermal, Energy & Environ. Engg.	3	8	7	4	-	22
13	Met. & Mat. Engg./ Metallurgical Engg.	-	2	-	2	-	4
14	Mining Engineering	6	11	2	2	-	21
15	Mining Engg./Safety Engg. & Disaster Mgt in Mines	-	-	-	-	-	-
16	Ocean Engg. & N.A.	2	4	2	-	-	8
<b>Total:</b>		<b>249</b>	<b>251</b>	<b>138</b>	<b>129</b>	<b>16</b>	<b>783</b>

**Table A-4A**

STUDENTS AWARDED ONLY FREE TUITIONSHIP 2006-2007

#	Course	1 <sup>st</sup> yr.	2 <sup>nd</sup> yr.	3 <sup>rd</sup> yr.	4 <sup>th</sup> yr.	5 <sup>th</sup> yr.	Total
<b>(A) B.Tech. 4-Year</b>							
1	Aerospace Engg.	-	2	1	1		4
2	Agri. & Food Engg.	-	1	-	-		1
3	Biotech. & Bioch. Engg.	-	2	-	1		3
4	Chemical Engg.	1	-	1	-		2
5	Civil Engg.	2	2	1	-		5
6	Computer Sc. & Engg.	-	-	3	-		3
7	Electrical Engg.	-	-	1	2		3
8	Electronics & ECE	1	-	3	-		4
9	Energy Engg.	-	-	1	-		1
10	Industrial Engg.	1	2	1	-		4
11	Instrumentation Engg.	-	-	2	1		3
12	Manuf. Sc. & Engg.	2	1	-	-		3
13	Mechanical Engg.	-	-	3	-		3
14	Met. & Mat. Engg.	1	-	2	-		3
15	Mining Engg.	1	2	3	-		6
16	Ocean Engg. & N.A.	2	-	1	-		3
<b>(B) B.Arch. 5-Year</b>							
	Architecture	3	3	1	-	2	9
<b>(C) M.Sc. Integrated 5-Year</b>							
1	Applied Geology	1	2	1	-		4
2	Economics	2	2				4
3	Expl. Geophysics	3	-	1	3		7
4	Industrial Chemistry	4	-	2	-	1	7
5	Maths. & Computing	-	-	1	-	1	2
6	Physics	1	1	1	2		5
7	Statistics & Informatics	3	1	-			4
<b>(D) M.Sc. 2-Year</b>							
1	Chemistry	1					1
2	Geophysics	2	3				5
3	Geological Sciences	-	3				3
4	Mathematics	1	3				4
5	Physics	2	-				2
6	Statistics & Informatics	2	-				2
<b>(E) Dual Degree 5-Year</b>							
1	Aerospace Engg.	-	2	-	1		3
2	Ag. & F. E./ Water Res. Dev. & Manag.	-	1	2	-		3
3	Biotech. & Bioch. Engg.	-	1	-	-		1
4	Chemical Engg.	2	-	1	-		3
5	Civil Engg./Struct. Engg.	-	1	2	-		3
6	Computer Sc. & Engg./ Comp. & Information Technology	-	-	2	-		2
7	Electrical Engg./Instrumentation Engg.	-	-	1	-		1
8	E & ECE/Automation & Comp. Vision	-	-	2	-		2
9	Industrial Engg./IEM	-	1	-	-		1
10	Manuf. Sc.& Engg./IEM	1	1	1	1		4
11	M.E./M.S. Engg.	-	2	2	2		6
12	M.E./Thermal, Energy & Environ. Engg.						
13	Met. & Mat. Engg./ Metallurgical Engg.	-	-	1	-		1
14	Mining Engineering	2	1		-		3
15	Mining Engg./Safety Engg. & Disaster Mgt in Mines						
16	Ocean Engg. & N.A.	-	-	1	-		1
	<b>Total:</b>	<b>41</b>	<b>40</b>	<b>45</b>	<b>14</b>	<b>4</b>	<b>144</b>

**Table A-4B**

STUDENTS GRANTED TUITION FEE EXEMPTION (ONLY SC / ST) 2006-2007

#	Course	1 <sup>st</sup> yr.		2 <sup>nd</sup> yr.		3 <sup>rd</sup> yr.		4 <sup>th</sup> yr.		5 <sup>th</sup> yr.		Total
		SC	ST	SC	ST	SC	ST	SC	ST	SC	ST	
<b>(A) B.Tech. 4-Year</b>												
1	Aerospace Engg.	3	2	2	0	2	0	3	1			13
2	Agri. & Food Engg.	2	0	0	0	0	0	2	0			04
3	Biotech. & Bioch. Engg.	3	0	1	1	1	1	2	1			10
4	Chemical Engg.	5	0	6	0	4	0	2	1			18
5	Civil Engg.	10	1	3	0	3	0	4	0			21
6	Computer Sc. & Engg.	6	3	5	2	4	3	6	3			32
7	Electrical Engg.	5	2	5	2	5	2	5	3			29
8	Electronics & ECE	6	3	5	2	4	2	5	2			29
9	Energy Engg.	2	1	5	1	3	0	1	1			14
10	Industrial Engg.	3	0	2	0	2	0	0	0			07
11	Instrumentation Engg.	3	1	3	1	3	1	3	2			17
12	Manuf. Sc. & Engg.	3	0	2	1	4	0	2	0			12
13	Mechanical Engg.	7	3	4	2	5	1	6	2			30
14	Met. & Mat. Engg.	7	0	6	0	3	0	4	0			20
15	Mining Engg.	7	1	2	0	0	0	1	1			12
16	Ocean Engg. & N.A.	6	0	2	0	3	0	3	0			14
<b>Total (A):</b>		<b>78</b>	<b>17</b>	<b>53</b>	<b>12</b>	<b>46</b>	<b>10</b>	<b>49</b>	<b>17</b>			<b>282</b>
<b>(B) B.Arch. 5-Year</b>												
	Architecture	-	-	-	-	-	-	-	-	-	-	-
<b>Total (B):</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>(C) M.Sc. Integrated 5-Year</b>												
1	Applied Geology	-	-	-	-	-	-	-	-	-	-	-
2	Economics	-	-	-	-	-	-	-	-	-	-	-
3	Expl. Geophysics	1	0	-	-	-	-	-	-	-	-	1
4	Industrial Chemistry	-	-	-	-	-	-	-	-	-	-	-
5	Maths. & Computing	6	0	3	0	0	0	1	0	2	0	12
6	Physics	4	0	-	-	-	-	-	-	-	-	4
7	Statistics & Informatics	1	0	-	-	-	-	-	-	-	-	1
<b>Total (C):</b>		<b>12</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>18</b>
<b>(D) M.Sc. 2-Year</b>												
1	Chemistry							5	1	5	1	12
2	Geophysics							-	-	0	1	1
3	Geological Sciences							3	1	2	1	7
4	Mathematics							3	0	3	2	8
5	Physics							5	1	5	0	11
6	Statistics & Informatics							1	0	-	-	1
<b>Total (D):</b>								<b>17</b>	<b>3</b>	<b>15</b>	<b>5</b>	<b>40</b>
<b>(E) M.Tech. Dual Degree 5-Year</b>												
1	Aerospace Engg.	2	0	2	0	-	-	2	0	1	0	7
2	Ag. & F. E./ Water Res. Dev. & Manag.	3	0	1	0	-	-	-	-	-	-	4
3	Biotech. & Bioch. Engg.	3	0	2	0	1	0	-	-	2	0	8
4	Chemical Engg.	4	0	3	0	1	0	3	0	2	0	13
5	Civil Engg./Struct. Engg.	3	0	3	0	0	0	1	0	-	-	7
6	Computer Sc. & Engg./ Comp. & Information Technology	4	2	2	4	3	1	2	1	5	2	26
7	Electrical Engg./Instrumentation Engg.	2	1	2	2	2	1	2	1	2	0	15
8	E & ECE/Automation & Comp. Vision	4	3	2	3	2	1	2	0	3	2	22
9	Industrial Engg./IEM	5	0	1	0	0	0	1	0	0	1	8
10	Manuf. Sc.& Engg./IEM	2	0	2	1	1	0	1	0	-	-	7
11	M.E./M.S. Engg.	-	-	-	-	-	-	-	-	-	-	-
12	M.E./Thermal, Energy & Environ. Engg.	4	2	4	1	4	1	1	2	7	0	26
13	Met. & Mat. Engg./ Metallurgical Engg.	1	0	-	-	1	0	1	0	1	0	4
14	Mining Engineering	2	0	-	-	-	-	-	-	-	-	2
15	Mining Engg./Safety Engg. & Disaster Mgt in Mines	-	-	-	-	-	-	-	-	-	-	-
16	Ocean Engg. & N.A.	4	0	2	0	0	0	1	1	1	0	9
<b>Total (E):</b>		<b>43</b>	<b>8</b>	<b>26</b>	<b>11</b>	<b>15</b>	<b>4</b>	<b>17</b>	<b>5</b>	<b>24</b>	<b>5</b>	<b>158</b>
<b>Total (A+B+C+D+E):</b>		<b>133</b>	<b>25</b>	<b>82</b>	<b>23</b>	<b>61</b>	<b>14</b>	<b>84</b>	<b>25</b>	<b>41</b>	<b>10</b>	<b>498</b>

**Table A-5**

STUDENTS (SC & ST) AWARDED FINANCIAL ASSISTANCE 2006-2007

**Rate: Pocket Allowance Rs.250/- p.m. plus Free Messing**

#	Course	1 <sup>st</sup> yr.		2 <sup>nd</sup> yr.		3 <sup>rd</sup> yr.		4 <sup>th</sup> yr.		5 <sup>th</sup> yr.		Total
		SC	ST	SC	ST	SC	ST	SC	ST	SC	ST	
<b>(A) B.Tech. 4-Year</b>												
1	Aerospace Engg.	-	-	1	-	-	-	-	-	-	-	1
2	Agri. & Food Engg.	-	-	-	-	-	-	-	-	-	-	-
3	Biotech. & Bioch. Engg.	-	-	-	-	-	-	-	-	-	-	-
4	Chemical Engg.	1	-	3	-	-	-	-	-	-	-	4
5	Civil Engg.	-	-	-	-	-	-	-	-	-	-	-
6	Computer Sc. & Engg.	-	1	-	-	-	-	-	-	-	-	1
7	Electrical Engg.	-	-	-	1	-	-	-	-	-	-	1
8	Electronics & ECE	-	-	-	-	-	-	-	-	-	-	-
9	Energy Engg.	-	1	-	-	-	-	-	-	-	-	1
10	Industrial Engg.	-	-	-	-	-	-	-	1	-	-	1
11	Instrumentation Engg.	-	-	-	-	-	-	-	-	-	-	-
12	Manuf. Sc. & Engg.	-	-	-	-	-	-	-	-	-	-	-
13	Mechanical Engg.	-	1	-	-	-	-	-	-	-	-	1
14	Met. & Mat. Engg.	1	-	1	-	2	-	-	-	-	-	4
15	Mining Engg.	-	1	1	-	-	-	-	-	-	-	2
16	Ocean Engg. & N.A.	2	-	-	-	-	-	-	-	-	-	2
<b>(B) B.Arch. 5-Year</b>												
	Architecture	-	-	-	-	-	-	-	-	-	-	-
<b>(C) M.Sc. Integrated 5-Year</b>												
1	Applied Geology	-	-	-	-	-	-	-	-	-	-	-
2	Economics	-	-	-	-	-	-	-	-	-	-	-
3	Expl. Geophysics	-	-	-	-	-	-	-	-	-	-	-
4	Industrial Chemistry	-	-	-	-	-	-	-	-	-	-	-
5	Maths. & Computing	2	-	-	-	-	-	-	-	-	-	2
6	Physics	-	-	-	-	-	-	-	-	-	-	-
7	Statistics & Informatics	-	-	-	-	-	-	-	-	-	-	-
<b>(D) M.Sc. 2-Year</b>												
1	Chemistry	3	-	2	-	-	-	-	-	-	-	5
2	Geophysics	-	1	1	1	-	-	-	-	-	-	3
3	Geological Sciences	-	-	-	-	-	-	-	-	-	-	-
4	Mathematics	2	-	-	-	-	-	-	-	-	-	2
5	Physics	3	1	-	-	-	-	-	-	-	-	4
6	Statistics & Informatics	-	-	-	-	-	-	-	-	-	-	-
<b>(E) Dual Degree 5-Year</b>												
1	Aerospace Engg.	-	-	-	-	-	-	-	-	-	-	-
2	Ag. & F. E./ Water Res. Dev. & Manag.	-	-	-	-	-	-	-	-	-	-	-
3	Biotech. & Bioch. Engg.	-	-	-	-	-	-	-	-	-	-	-
4	Chemical Engg.	2	-	-	-	-	-	-	-	-	-	2
5	Civil Engg./Struct. Engg.	-	-	-	-	-	-	-	-	-	-	-
6	Computer Sc. & Engg./ Comp. & Information Technology	-	-	-	-	-	-	-	-	-	-	-
7	Electrical Engg./ Instrumentation Engg.	-	-	-	-	-	-	1	-	-	-	1
8	E & ECE/Automation & Comp. Vision	-	-	-	-	-	1	-	-	-	-	1
<b>(E) Dual Degree 5-Year</b>												
9	Industrial Engg./IEM.	-	-	1	-	-	-	-	-	-	-	1
10	Manuf. Sc & Engg./ IEM	-	-	1	-	-	-	-	-	-	-	1
11	M.E./M.S. Engg.	-	-	-	-	-	-	-	-	-	-	-
12	M.E./Thermal, Energy & Environ. Engg..	-	-	-	-	-	-	-	-	-	-	-
13	Met. & Mat. Engg./ Metallurgical Engg.	-	-	1	-	-	-	-	-	-	-	1
14	Mining Engineering	-	-	-	-	-	-	-	-	-	-	-
15	Mining Engg./Safety Engg. & Disaster Mgt in Mines	1	-	-	-	-	-	-	-	-	-	1
16	Ocean Engg. & N.A.	-	-	-	-	-	-	-	-	-	-	-
	<b>Total:</b>	<b>17</b>	<b>6</b>	<b>12</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>42</b>

**Table A-6****A. STUDENTS AWARDED ENDOWMENT PRIZES : 2006–2007****1. ENDOWMENT PRIZES - (UNDERGRADUATE)**

#	Name of Prize	Name of the winner	Instt Roll No.	Amount (Rs.)
1.	Sarat Memorial Prize	Piya Pal	03EC1006	500
2.	Suhasini Devi Memorial Prize	Anjali Singhal,	03MT1007	500
3.	P. K Bhattacharya Memorial Prize	Abhishek Kumar Prakash	02EX2015	500
4.	Sachinandan Basak Memorial Prize	Gautam Acharyya	05CE1028	500
5.	Amlan Sen Memorial Prize	Anupam Bhasker Kapoor	03ME1041	1,000
6.	Swapan Kumar Saha Memorial Prize	Arka Majumdar	03EC1024	1,000
7.	Medury Bhanumurthy Memorial Prize	Anjali Singhal,	03MT1007	350
8.	H. N. Bose Memorial Prize	Dharmesh Jain	02PH2017	3,000
9.	Sharmila Bose Memorial Prize	Rumi Ghosh	02MA2021	3,000
10.	Bigyan Sinha Memorial Prize	Shaunak Chatterjee	03CS1003	1,000
11.	Usha Martin Award	Debashis Kar	03MT1009	1,000
12.	Systems Society Award	Jointly: 1.Rangoli Sharan 2.Kuvalekar Aditya Vijay	03EE1033 03EG1020	1,250 1,250
13.	Prof. K. L. Chopra Award	Sreya Gupta	05CY4010	1,000
14.	Charubala Devi Memorial Prize	Rithe Rahul Kumar Jagdish	04EC1029	1,000
15.	Gouri Basak Design Award	Indradeep Kumar	03AR1006	1,000
16.	Prof. Prabodh Chandra Sanyal Award	Jointly: 1.Jha Rajiv S. Yogmaya 2. Sarbari Mitra	05MA4008 05MA4005	500 500
17.	B. L. Nagpal Memorial Prize	Priyanka Thamma	04CE1009	2,000
18.	Umesh Kumar Bhatia Sports Prize	Amritanshu Kumar	03CE1012	1,000
19.	Pradeep Kumar Chakraborty Award	Sudhanshu Shekhar Singh	04MT1011	1,000
20.	G. B. Mitra Award	Dharmesh Jain	02PH2017	1,000
21.	Bhartiya Cutler Hammer Prize	Debjit Biswas	04EE1033	3,000
22.	Mansara Prize	Indradeep Kumar	03AR1006	1,000
23.	R. M. Lalwani Prize	Rithe Rahul Kumar Jagdish	04EC1029	1,000
24.	H. P. Bhadury Memorial Prize	Sourav Padhy	04ME1042	1,500
25.	John Von Neuman Award	Rithe Rahul Kumar Jagdish	04EC1029	2,500
26.	Prof.S.K.Nandi Memorial Prize	Parekh Asha	04CH1027	500
27.	International Symposium (Microwave & Communication) 1981 Prize	Rithe Rahul Kumar Jagdish	04EC1029	3,000
28.	Class Of 1970 Alumni (US) Association Prize	Sudip Roy	05CS1035	2,500
29.	Technology Alumni Association (Delhi Chapter) Award	Abhinav Gupta	06CS1014	1,500
30.	IITKharagpur Alumni (California Chapter) Award	Sudip Roy	05CS1035	3,000
31.	Ram Gopal Kabre Memorial Prize	Gopikrishnan V	05AR1010	1,000
32.	Prof. S. P. Sengupta Memorial Prize	Debapriya Chakraborty	03MF1020	2,500
33.	K. Rama Rao Endowment Prize	Devanshu Agrawal	04AG1012	2,500
34.	Smt. Ava Sanyal Memorial Prize	Sudhanshu Shekhar Singh	04MT1011	2,500
35.	Prof. B. N. Avasthi Memorial Award For Sports	Prashant Thakur (Male) Anjali Singhal (Female)	02MF3011 03MT1007	2,500 2,500
36.	Prof. Sunil Kanti Sen Memorial Award	Shaurya Verma	06AE1011	4,000
37.	Prof. Sudhir Ranjan Sengupta Memorial Prize	Swarnavo Sarkar	03CE1019	2,000
38.	Best B.Tech. Project Thesis Award By Mr. Mitrajit Mukhopadhyay	1 <sup>st</sup> – Shonam Khaitan 2 <sup>nd</sup> – G. Navakanth Reddy 3 <sup>rd</sup> – Nandlal Khatri	03CH1013 03CH1005 03CH1009	25,000 15,000 10,000
39.	A. A. Hakim Memorial Endowment Prize	Kaushik Malpani	02AG3004	2,500
40.	Keshab K Parhi Endowment Prize	Kanupriya Bhardwaj	02EE3014	15,000
41.	Nilanjan Ganguly Memorial Award For E&ECE Deptt	Abhishek Ghosh	03EC1005	10,000
42.	Nilanjan Ganguly Memorial Award For Physics Deptt	Dharmesh Jain	02PH2017	10,000

## 2. J. C. GOSH MEMORIAL PRIZES

#	DEPARTMENTS	Name of the winner	Instt Roll No.	Amount (Rs.)
1.	Aerospace Engineering	Nishan Jain	04AE1013	2000
2.	Agricultural & Food Engineering	Devanshu Agrawal	04AG1012	2000
3.	Biotechnology & Biochemical Engineering	Debkishore Mitra	04BT1003	2000
4.	Chemical Engineering	Parekh Asha	04CH1027	2000
5.	Civil Engineering	Priyanka Thamma	04CE1009	2000
6.	Computer Science & Engineering	Abhijeet Mohapatra	04CS1019	2000
7.	Electrical Engineering	Debjit Biswas	04EE1033	2000
8.	Energy Engineering	Parag Jain	04EG1001	2000
9.	Instrumentation Engineering	Pawan Lunia	04IE1021	2000
10.	Electronics & Electrical Commu. Engineering	Rithe Rahul Kumar Jagdish	04EC1029	2000
11.	Industrial Engineering	Arya Ghatak Choudhury	04IM1014	2000
12.	Mechanical Engineering	Sourav Padhy	04ME1042	2000
13.	Manufacturing Science & Engineering	Surya Pratap Mishra	04MF1018	2000
14.	Metallurgical & Materials Engineering	Sudhanshu Shekhar Singh	04MT1011	2000
15.	Mining Engineering	Sayan Deb Kundu	04MI1007	2000
16.	Ocean Engineering & Naval Architecture	Vineet Bhardwaj	04NA1014	2000
17.	Architecture & Regional Planning	Indradeep Kumar	03AR1006	2000
18.	Industrial Chemistry	Hemakesh Mohapatra	03CY2004	2000
19.	Applied Geology	Shruti Gupta	03GG2008	2000
20.	Exploration Geophysics	Harshvardhan	03EX2007	2000
21.	Mathematics & Computing	Shrivastava Anshumali Abhai	03MA2001	2000
22.	Physics	Anirban Ghosh	03PH2001	2000

## 3. BEST PROJECT AWARD

### a) 4-YEAR B. TECH.(HONS.) COURSES :

#	DEPARTMENTS	Name of the winner	Instt Roll No.	Amount (Rs.)
1.	Aerospace Engineering	Amartya Sankar Banerjee	03AE1001	1,000
2.	Agricultural & Food Engineering	P.Satish Kumar	03AG1004	1,000
3.	Biotechnology & Biochemical Engineering	Borna Ghosh	03BT3013	1,000
4.	Chemical Engineering	Jointly : Abhishek Dutta Ankur Gupta	03CH1001 03CH3001	500 500
5.	Civil Engineering	Swarnavo Sarkar	03CE1019	1,000
6.	Computer Science & Engineering	Virendra Singh Sekhawat	03CS1019	1000
7.	Electrical Engineering	Angik Sarkar	03EE1003	1,000
8.	Energy Engineering	Amal Kiran	03EG1021	1,000
9.	Instrumentation Engineering	Amit Kumar	03IE1022	1,000
10.	Industrial Engineering	V.Harish Kommaraju	03IM3005	1,000
11.	Electronics & Electrical Comm. Engineering	Kaushik Dasgupta	03EC3202	1,000
12.	Mechanical Engineering	Rahul Dash	03ME1004	1,000
13.	Manufacturing Science & Engineering	Shubhasish Chattoraj	03MF1005	1,000
14.	Mining Engineering	Sumit Kumar	03MI1002	1,000
15.	Ocean Engineering & Naval Architecture	Rahul Barman	03NA1013	1,000



**b) 5-YEAR B. ARCH. (HONS.) COURSE :**

#	DEPARTMENTS	Name of the winner	Instt Roll No.	Amount (Rs.)
1.	Architecture & Regional Planning	Himadri Mayank	02AR1001	1,000

**c) 5-YEAR DUAL DEGREE COURSES :**

#	DEPARTMENTS	Name of the winner	Instt Roll No.	Amount (Rs.)
1.	Aerospace Engineering (AE1)	Rohit Gupta	02AE3007	1,000
2.	Agricultural & Food Engineering (AG1)	Kaushik Malpani	02AG3004	1,000
3.	Biotechnology & Biochemical Engineering (BT1)	Sagar Goel	02BT3012	1,000
4.	Chemical Engineering (CH1)	Swati	02CH3009	1,000
5.	Civil Engineering (CE1)	Tarun Bhabra	02CE3007	1,000
6.	Computer Science & Engineering (CS1)	Monu Kedia	02CS3023	1,000
7.	Electrical Engineering (EE1)	Bitihotra Routroy	02EE3013	1,000
8.	Electronics & Elect. Commu. Engineering (EC1)	Kaushik Sengupta	02EC3016	1,000
9.	Industrial Engineering & Management (IM1)	Rajiv Dandotiya	02IM3003	1,000
10.	Mechanical Engineering (ME1)	Ambuj Saxena	02ME3010	1,000
11.	Mechanical Engineering (ME2)	Shashi Bhushan	02ME3029	1,000
12.	Manufacturing Science & Engineering (MF1)	Sneha Prasad	02MF3004	1,000
13.	Metallurgical & Materials Engineering (MT1)	Atish Kumar Hatui	02MT3007	1,000
14.	Mining Engineering (MI1)	Sama Mayank	02MI3003	1,000
15.	Ocean Engineering & Naval Architecture (NA1)	Sumit Narayan	02NA3004	1,000

**d) 5-YEAR M. SC. COURSES :**

#	DEPARTMENTS	Name of the winner	Instt Roll No.	Amount (Rs.)
1.	Industrial Chemistry	Himanshu Shekhar	02CY2007	1,000
2.	Exploration Geophysics	Abhishek Kumar Prakash	02EX2015	1,000
3.	Mathematics & Computing	Rumi Ghosh	02MA2021	1,000
4.	Physics	Dharmesh Jain	02PH2017	1,000

**e) 2-YEAR M. SC. COURSES :**

#	DEPARTMENTS	Name of the winner	Instt Roll No.	Amount (Rs.)
1.	Chemistry	Nandini Pal	05CY4016	1,000
2.	Geological Sciences	Krishnendu Chatterjee	05GG4017	1,000
3.	Geophysics	Tania Mukherjee	05EX4005	1,000
4.	Mathematics	Shirsendu Nandi	05MA4009	1,000
5.	Physics	Chirasree Sarkar	05PH4015	1,000
6.	Statistics & Informatics	Jointly: Suvendu Sarkar Anindita Sengupta	05SI4009 05SI4012	500 500

**B. STUDENTS AWARDED ENDOWMENT MERIT SCHOLARSHIP : 2006–2007**

#	Name of the Scholarship	Name of the Scholarship holder with Roll Number	Amount (Rs.)
1	B.P.Poddar Merit Scholarship	Arka Majumdar, 03EC1024	1000/- P.M.
2	Vinod Gupta Leadership Scholarship	M. Shiva Kr., 04AG1008	400/- P.M.
3	Kumud Manorama Memorial Scholarship	Sourav Padhy, 04ME1042	1000/- P.M.
4	Hemchandra Rout Memorial Scholarship	Rahul Barman, 03NA1013	500/- P.M.
5	Mrs. Minoti Bagchi Memorial Scholarship	Manjul Apratim, 03E1002	1000/- P.M.
6	Gour Chandra Saha Memorial Scholarship	Vaibhav Sharma, 06EC1027	1000/- P.M.
7	Puri Memorial Scholarship	a) Ashutosh N Bagaria, 04EE1035 b) Chanchal Kumar, 06CE1003	1000/- P.M. 1000/- P.M.
8	American Business List Humanities Scholarship	Goparaju Sreechakra, 03EC3502	400/- P.M.
9	Technology Alumni Association (Kharagpur Chapter) Scholarship	Rithe Rahul Kr. Jagdish, 04EC1029	1000/- P.M.
10	Technology Alumni Association (Calcutta Chapter) Scholarship	Abhinav Gupta, 06CS1014	500/- P.M.
11	K.K. Agarwal Memorial Scholarship	Jyoti Agarwal, 03AG3303	400/- P.M.
12	Indian Women's Association Bonn Scholarship	Dharma Raj, 06NA1001	1500/- P.M.
13	HPCL Start Up Scholarship	a) Arit Kr. Mondall, 06CS1008 b) Akash Rao, 06CS1009 c) Marut Agarwal, 06CS1010 d) Santanu Mondal, 06EC1013 e) Ravi Ratan Baipai, 06CS1002	1000/- P.M. 1000/- P.M. 1000/- P.M. 1000/- P.M. 1000/- P.M.
14	Devi Mahamaya Mallick Memorial Scholarship	Dipak Kr. Paul, 06MA2004	1200/- P.M.
15	Dr. Arunabha Chatterjee Memorial Scholarship	Dharmesh Jain, 02PH2017	4380/- P.M.
16	Goralal Syngal Memorial Scholarship	a) Sourabh Maiti, 03EC1001 b) Sougata Sarkar, 04EC1004 c) Vinu Rajasekhar, 05CS3025 d) Prateek, 06CS1006 e) Sunav Choudhary, 05EC1009 f) Susil Subramanian, 05EC1030 g) Abhijeet Mahapatra, 04CS1019	2100/- P.M. 2100/- P.M. 2100/- P.M. 2100/- P.M. 2100/- P.M. 2100/- P.M. 2100/- P.M.
17	M. K. Sircar Memorial Scholarship	a) Arpit Jain, 05CG1021 b) Suman Mallick, 05MF1001	1000/- P.M. 1000/- P.M.
18	Prova Basu Memorial Scholarship	Ankur Kothari, 04IE1015	12,000/- per annum
19	Mrinal Chandra Basu Memorial Scholarship	Sankar Nath Dutta, 03EG1006	12,000/- per annum
20	ABS Scholarship	Rajnish Kr., 03NA3008	1000/- P.M.
21	Gurukripa 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	2500/- P.M. 2500/- P.M. 2500/- P.M. 2500/- P.M. 2500/- P.M.
23	Rajendra Nath Das Merit-cum-Means Awards	a) Parth Sethi, 05EC1025 b) Sudip Roy, 05CS1035 c) Mayank Kr. Bhagat, 05EE1014 d) K. M. Saravana Kr., 05BT3013 e) K. Naveen Kr., 05IE1020 f) Susil Agrawal, 05ME3034	25,000/- 25,000/- 25,000/- 25,000/- 25,000/- 25,000/-

**Table A-7**  
STUDENTS AWARDED SCHOLARSHIPS BY EXTERNAL AGENCIES  
(2006-2007)

#	Awarding Organization	No. of Recipients
1.	National Council of Educational Reseach & Training, Sri Aurobinda Marg, New Delhi 16	80
2.	Directorate of Technical Education, West Bengal	
3.	Directorate of Education, New Delhi	
4.	Directorate of Higher Education, Tripura	
5.	Directorate of Collegiate Education, Trivandrum, Kerala	1
6.	Directorate of Technical Education, Bhopal, MP	
7.	Directorate of Higher Education, Bhubaneswar, Orissa	
8.	Directorate of Higher Education, Chandigarh, Haryana	1
9.	Board of Madhyamik Education, Rajasthan	
10.	Steel Authority of India Ltd., Durgapur, Rourkela, Bhilai, Vishakhapatnam Steel Plant, <b>Bokaro</b>	6
11.	Office of the Administrator, Mining Areas Development Fund, Govt. of Orissa	
12.	R.I. District Education, New Delhi.	
13.	Department of Telecommunication, Calcutta.	
14.	Central Coal-fields Ltd., Ranchi.	
15.	I.A.F. Benovolent Association, New Delhi.	
16.	Department of Telecommunication, Bhubaneswar (BSNL)	
17.	Eastern Coal-fields Ltd., Calcutta.	
18.	Department of Telecommunication, Madras.	
19.	Institute of Engineers, Calcutta.	
20.	Oil and Natural Gas Commission, Calcutta.	
21.	Jagadish Chandra Bose National Talent Search, Calcutta	12
22.	Jubilee Scholarship Committee, TISCO, Jamshedpur.	
23.	Metallurgical & Engineering Consultants (India) Ltd, Ranchi	
24.	Indian Oil Corporation Ltd., New Delhi.	2
25.	Bharat Petroleum Corporation Ltd. Bombay.	
26.	Indian Council for Cultural Relations, Azad Bhaban IP Estate, Foreign Student Division, New Delhi	
27.	Indo-Bangladesh Scholarship.	
28.	Zindal Trust, New Delhi	
29.	Paradip Port Trust, Orissa	
30.	Education Department, A.P.	
31.	National Educational Council, Shillong	
32.	CMERI, Durgapur	
33.	TATA Millennium Scholarship (Russi Mody)	20
34.	Naval Research Fellowship (Scholarship), Naval HQ. New Delhi	
35.	AR & DB Scholarship, Ministry of Def. Govt of India	
36.	Coal Fields India Ltd.	
37.	Pratibha Scholarship, A.P.	26
38.	Rajendra Vidyalaya, Jamshedpur	
39.	TAYO Scholarship, Jamshedpur	
40.	NEC, Shilong	
41.	Jagriti, New Delhi	
42.	CBSE, New Delhi	1
43.	MECON, Ranchi	1
	<b>TOTAL:</b>	<b>150</b>

**Table A-8**

STUDENTS FROM FOREIGN COUNTRIES ON ROLL OF UNDERGRADUATE COURSES,  
CLASS WISE, 2006 – 2007

#	Course	1 <sup>st</sup> yr.	2 <sup>nd</sup> yr.	3 <sup>rd</sup> yr.	4 <sup>th</sup> yr.	5 <sup>th</sup> yr.	Total
<b>(A) B.Tech. 4-Year</b>							
1	Aerospace Engg.	-	-	-	-	-	-
2	Agri. & Food Engg.	-	-	-	-	-	-
3	Biotech. & Bioch. Engg.	-	-	-	-	-	-
4	Chemical Engg.	-	-	-	-	-	-
5	Civil Engg.	-	-	-	-	-	-
6	Computer Sc. & Engg.	-	-	-	-	-	-
7	Electrical Engg.	-	-	-	-	-	-
8	Electronics & ECE	-	-	-	-	-	-
9	Energy Engg.	-	-	-	-	-	-
10	Industrial Engg.	-	-	-	-	-	-
11	Instrumentation Engg.	-	-	-	-	-	-
12	Manuf. Sc. & Engg.	-	-	-	-	-	-
13	Mechanical Engg.	-	-	-	-	-	-
14	Met. & Mat. Engg.	-	-	-	-	-	-
15	Mining Engg.	-	-	-	-	-	-
16	Ocean Engg. & N.A.	-	-	-	-	-	-
<b>(B) B.Arch. 5-Year</b>							
	Architecture	-	-	-	-	-	-
<b>(C) M.Sc. Integrated 5-Year</b>							
1	Applied Geology	-	-	-	-	-	-
2	Economics	-	-	-	-	-	-
3	Expl. Geophysics	-	-	-	-	-	-
4	Industrial Chemistry	-	-	-	-	-	-
5	Maths. & Computing	-	-	-	-	-	-
6	Physics	-	-	-	-	-	-
7	Statistics & Informatics	-	-	-	-	-	-
<b>(D) M.Sc. 2-Year</b>							
1	Chemistry	-	-	-	-	-	-
2	Geophysics	-	-	-	-	-	-
3	Geological Sciences	-	-	-	-	-	-
4	Mathematics	-	-	-	-	-	-
5	Physics	-	-	-	-	-	-
6	Statistics & Informatics	-	-	-	-	-	-
<b>(E) Dual Degree 5-Year</b>							
1	Aerospace Engg.	-	-	-	-	-	-
2	Ag. & F. E./ Water Res. Dev. & Manag.	-	-	-	-	-	-
3	Biotech. & Bioch. Engg.	-	-	-	-	-	-
4	Chemical Engg.	-	-	-	-	-	-
5	Civil Engg./Struct. Engg.	-	-	-	-	-	-
6	Computer Sc. & Engg.	-	-	-	-	-	-
7	Electrical Engg./Instrumentation	-	-	-	-	-	-
8	E & ECE/Automation & Comp. Vision	-	-	-	-	-	-
9	Industrial Engg./IEM	-	-	-	-	-	-
10	Manuf. Sc.& Engg./IEM	-	-	-	-	-	-
11	M.E./M.S. Engg.	-	-	-	-	-	-
12	M.E./Thermal, Energy & Environ. Engg.	-	-	-	-	-	-
13	Met. & Mat. Engg./ Metallurgical Engg.	-	-	-	-	-	-
14	Mining Engineering	-	-	-	-	-	-
15	Mining Engg./Safety Engg. & Disaster Mgt in Mines	-	-	-	-	-	-
16	Ocean Engg. & N.A.	-	-	-	-	-	-
<b>Total:</b>		-	-	-	-	-	NIL

**Table A-9**

**COUNTRY-WISE DISTRIBUTION OF FOREIGN STUDENTS (2006-2007)**

Name of the Country	B.Tech.(H)/B.Arch.(H)/M.Sc./Dual	Total
NIL	NIL	NIL
<b>TOTAL</b>	NIL	NIL

**Table A-10**

**STUDENTS ON ROLL – UNDERGRADUATE (B.TECH/B.ARCH./M.SC./DUAL DEGREE) COURSES  
AT THE BEGINNING OF THE SESSION 2006 – 2007**

#	Course	1 <sup>st</sup> yr.		2 <sup>nd</sup> yr.		3 <sup>rd</sup> yr.		4 <sup>th</sup> yr.		5 <sup>th</sup> yr.		Total
		M	F	M	F	M	F	M	F	M	F	
<b>(A) B.Tech. 4-Year</b>												
1	Aerospace Engg.	19	2	18	2	13	1	18	0	-	-	<b>73</b>
2	Agri. & Food Engg.	17	3	10	2	8	2	8	0	-	-	<b>50</b>
3	Biotech. & Bioch. Engg.	15	2	10	2	10	0	10	1	-	-	<b>50</b>
4	Chemical Engg.	30	1	29	4	20	3	29	1	-	-	<b>117</b>
5	Civil Engg.	40	2	26	1	25	1	25	1	-	-	<b>121</b>
6	Computer Sc. & Engg.	38	0	35	2	35	2	40	1	-	-	<b>153</b>
7	Electrical Engg.	32	3	35	1	32	2	31	1	-	-	<b>137</b>
8	Electronics & ECE	39	1	32	0	30	1	28	4	-	-	<b>135</b>
9	Energy Engg.	18	1	20	0	15	0	17	0	-	-	<b>71</b>
10	Industrial Engg.	18	0	15	0	12	0	13	0	-	-	<b>58</b>
11	Instrumentation Engg.	18	1	20	1	17	3	18	3	-	-	<b>81</b>
12	Manuf. Sc. & Engg.	18	0	20	0	18	1	18	0	-	-	<b>75</b>
13	Mechanical Engg.	44	0	41	0	42	0	43	0	-	-	<b>170</b>
14	Met. & Mat Engg.	26	3	17	3	18	0	14	3	-	-	<b>84</b>
15	Mining Engg.	27	1	14	0	13	0	9	0	-	-	<b>64</b>
16	Ocean Engg. & N.A.	22	1	14	0	12	2	15	0	-	-	<b>66</b>
<b>TOTAL (A):</b>		<b>421</b>	<b>21</b>	<b>356</b>	<b>18</b>	<b>320</b>	<b>18</b>	<b>336</b>	<b>15</b>	-	-	<b>1505</b>
<b>(B) B.Arch. 5-Year</b>												
	Architecture	17	8	15	3	10	2	12	0	12	2	<b>81</b>
<b>TOTAL (B):</b>		<b>17</b>	<b>8</b>	<b>15</b>	<b>3</b>	<b>10</b>	<b>2</b>	<b>12</b>	<b>0</b>	<b>12</b>	<b>2</b>	<b>81</b>
<b>(C) M.Sc. Integrated 5-Year</b>												
1	Applied Geology	15	1	4	2	9	3	7	3	3	0	<b>47</b>
2	Economics	23	0	11	0	-	-	-	-	-	-	<b>34</b>
3	Expl. Geophysics	18	0	7	2	14	1	11	3	7	1	<b>64</b>
4	Industrial Chemistry	14	3	5	0	14	2	12	4	7	1	<b>62</b>
5	Maths. & Computing	22	1	22	0	16	5	20	0	19	4	<b>109</b>
6	Physics	21	1	12	1	13	5	20	2	11	0	<b>86</b>
7	Statistics & Informatics	21	1	23	0	-	-	-	-	-	-	<b>45</b>
<b>TOTAL (C):</b>		<b>134</b>	<b>7</b>	<b>84</b>	<b>5</b>	<b>66</b>	<b>16</b>	<b>70</b>	<b>12</b>	<b>47</b>	<b>6</b>	<b>447</b>
<b>(D) M.Sc. 2-Year</b>												
1	Chemistry	-	-	-	-	-	-	22	6	23	5	<b>56</b>
2	Geological Sciences	-	-	-	-	-	-	10	10	16	4	<b>40</b>
3	Geophysics	-	-	-	-	-	-	7	0	8	2	<b>17</b>
4	Mathematics	-	-	-	-	-	-	18	2	13	5	<b>38</b>
5	Physics	-	-	-	-	-	-	21	7	24	2	<b>54</b>
6	Statistics & Informatics	-	-	-	-	-	-	18	2	11	2	<b>33</b>
<b>TOTAL (D):</b>		-	-	-	-	-	-	<b>96</b>	<b>27</b>	<b>95</b>	<b>20</b>	<b>238</b>

Table A-10 (Continued)

#	Course	1 <sup>st</sup> yr.		2 <sup>nd</sup> yr.		3 <sup>rd</sup> yr.		4 <sup>th</sup> yr.		5 <sup>th</sup> yr.		Total
		M	F	M	F	M	F	M	F	M	F	
<b>(E) Dual Degree 5-Year</b>												
1	Aerospace Engg.	11	0	9	1	9	0	10	0	7	0	47
2	Ag. & F. E./ Water Res. Dev. & Manag.	14	3	9	0	6	0	2	4	5	0	43
3	Biotech. & Bioch. Engg.	13	2	12	1	12	1	9	3	11	1	65
4	Chemical Engg.	17	0	13	3	10	0	7	1	10	3	64
5	Civil Engg./Struct. Engg.	12	1	11	0	6	0	6	0	7	0	43
6	Computer Sc. & Engg./ Comp. & Information Technology	23	2	25	0	26	0	21	1	31	1	130
7	Electrical Engg./ Instru. Engg.	15	0	15	0	14	1	15	1	12	2	75
8	E & ECE/Automation & Comp. Vision	25	1	18	1	17	2	17	0	18	0	99
9	Industrial Engg./IEM	18	0	10	0	7	1	9	0	10	0	55
10	Manuf. Sc. & Engg./IEM	11	1	11	0	12	0	9	0	11	1	56

Table A-11

## STATEMENT OF RESULTS (UNDERGRADUATE) 2006-2007

#	Course	1 <sup>st</sup> yr.		2 <sup>nd</sup> yr.		3 <sup>rd</sup> yr.		4 <sup>th</sup> yr.		5 <sup>th</sup> yr.		Total
		P	I	P	I	P	I	P	I	P	I	
<b>(A) B.Tech. 4-Year</b>												
1	Aerospace Engg.	17	5	20	-	13	2	17	-	-	-	74
2	Agri. & Food Engg.	14	1	10	2	10	-	7	1	-	-	45
3	Biotech. & Bioch. Engg.	16	1	10	2	10	-	10	-	-	-	49
4	Chemical Engg.	35	-	33	-	21	2	30	-	-	-	121
5	Civil Engg.	31	5	24	3	24	2	25	1	-	-	115
6	Computer Sc. & Engg.	39	2	33	3	31	6	33	3	-	-	150
7	Electrical Engg.	38	2	33	3	34	-	29	2	-	-	141
8	Electronics & ECE	43	1	30	2	26	3	31	-	-	-	136
9	Energy Engg.	13	2	17	3	14	1	17	-	-	-	67
10	Industrial Engg.	20	1	14	1	11	1	13	-	-	-	61
11	Instrumentation Engg.	21	1	17	4	20	-	20	-	-	-	83
12	Manuf. Sc. & Engg.	21	1	14	6	14	4	18	-	-	-	78
13	Mechanical Engg.	43	5	39	2	32	10	40	-	-	-	171
14	Met. & Mat. Engg.	19	3	17	3	16	2	14	2	-	-	76
15	Mining Engg.	16	8	11	3	11	2	8	1	-	-	60
16	Ocean Engg. & N.A.	17	4	12	2	14	-	14	-	-	-	63
	<b>Total (A)</b>	<b>403</b>	<b>42</b>	<b>334</b>	<b>39</b>	<b>301</b>	<b>35</b>	<b>326</b>	<b>10</b>	-	-	<b>1490</b>
<b>(B) B.Arch. 5-Year</b>												
	Architecture	24	1	17	1	11	1	10	2	12	1	80
	<b>Total (B)</b>	<b>24</b>	<b>1</b>	<b>17</b>	<b>1</b>	<b>11</b>	<b>1</b>	<b>10</b>	<b>2</b>	<b>12</b>	<b>1</b>	<b>80</b>
<b>(C) M.Sc. Integrated 5-Year</b>												
1	Applied Geology	11	1	4	2	10	2	10	-	3	-	43
2	Economics	17	2	10	1	-	-	-	-	-	-	30

Table A-11 (Continued)

#	Course	1 <sup>st</sup> yr.		2 <sup>nd</sup> yr.		3 <sup>rd</sup> yr.		4 <sup>th</sup> yr.		5 <sup>th</sup> yr.		Total
		P	I	P	I	P	I	P	I	P	I	
3	Expl. Geophysics	13	2	8	1	14	1	14	-	8	-	61
4	Industrial Chemistry	7	1	5	-	16	-	14	1	8	-	52
5	Maths. & Computing	23	1	17	5	17	4	17	2	22	-	108
6	Physics	16	3	8	5	14	4	20	2	10	1	83
7	Statistics & Informatics	23	4	23	-	-	-	-	-	-	-	50
	<b>Total (C)</b>	<b>110</b>	<b>14</b>	<b>75</b>	<b>14</b>	<b>71</b>	<b>11</b>	<b>75</b>	<b>5</b>	<b>51</b>	<b>1</b>	<b>427</b>
<b>(D) M.Sc. 2-Year</b>												
1	Chemistry	27	-	28	-	-	-	-	-	-	-	55
2	Geophysics	7	-	10	-	-	-	-	-	-	-	17
3	Geological Sciences	20	-	20	-	-	-	-	-	-	-	40
4	Mathematics	17	2	18	-	-	-	-	-	-	-	37
5	Physics	25	-	26	-	-	-	-	-	-	-	51
6	Statistics & Informatics	18	1	13	-	-	-	-	-	-	-	32
	<b>Total (D)</b>	<b>114</b>	<b>3</b>	<b>115</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>232</b>
<b>(E) Dual Degree 5-Year</b>												
1	Aerospace Engg.	9	2	9	1	6	3	9	-	7	-	46
2	Ag. & F. E./ Water Res. Dev. & Manag.	15	2	7	2	6	-	6	-	5	-	43
3	Biotech. & Bioch. Engg.	12	1	11	2	12	1	10	2	11	1	63
4	Chemical Engg.	18	2	16	-	10	-	7	1	12	-	66
5	Civil Engg./Struct. Engg.	13	1	9	2	5	1	6	-	7	-	44
6	Computer Sc. & Engg./ Comp. & Information Technology	26	2	20	5	22	4	20	2	22	1	124
7	Electrical Engg./Instru. Engg.	17	-	15	-	14	1	16	-	12	2	77
8	E & ECE/Automation & Comp. Vision	27	1	16	3	16	4	17	-	16	1	101
9	Industrial Engg./IEM	15	2	8	2	8	-	8	1	10	-	54
10	Manuf. Sc.& Engg./IEM	11	1	9	2	12	1	8	1	11	-	56
11	M.E./M.S. Engg.	32	1	26	4	24	5	27	2	26	1	148
12	Met. & Mat. Engg./ Metallurgical Engg.	7	1	7	1	5	1	6	-	6	-	34
13	Mining Engineering	15	1	15	-	5	1	6	-	3	-	46
14	Ocean Engg. & N.A.	9	1	8	2	6	-	9	-	9	-	44
	<b>Total (E)</b>	<b>226</b>	<b>18</b>	<b>176</b>	<b>26</b>	<b>151</b>	<b>22</b>	<b>155</b>	<b>9</b>	<b>157</b>	<b>6</b>	<b>946</b>
	<b>TOTAL (A+B+C+D+E)</b>	<b>877</b>	<b>78</b>	<b>717</b>	<b>80</b>	<b>534</b>	<b>69</b>	<b>566</b>	<b>26</b>	<b>220</b>	<b>8</b>	<b>3175</b>

P – Passed, I – Incomplete

**TABLE : B-1**

**ADMISSION TO POSTGRADUATE COURSES IN 2006-2007**

Dept./ Centre	Specialization	Admt	Regu- lar	SP	QIP	DF	GN	SC	ST	PH	M	F
AE	Aerospace Engineering	15	13	-	-	2	12	2	1	-	14	1
AgFE	Farm Machinery & Power	15	15	-	-	-	12	2	1	-	15	-
	Soil & Water Conservation Engineering	09	9	-	-	-	7	2	-	-	5	4
	Dairy & Food Engineering	13	13	-	-	-	10	2	1	-	12	1
	Applied Botany	12	12	-	-	-	11	1	-	-	11	1
	Water Resource Development & Mangt.	08	8	-	-	-	7	1	-	-	8	-
	Aquacultural Engineering	05	4	1	-	-	4	1	-	-	4	1
	Agril. System & Management	08	8	-	-	-	7	1	-	-	6	2
	Post Harvest Engineering.	13	13	-	-	-	10	2	1	-	11	2
ARP	City Planning	24	24	-	-	-	18	4	2	-	15	9
ChE	Chemical Engineering.	51	50	-	-	1	40	6	5	-	46	5
Civil	Hydraulic & Water Res. Engineering.	08	8	-	-	-	7	1	-	-	7	1
	Transportation Engineering.	10	10	-	-	-	7	2	1	-	10	-
	Environmental Engineering & Managt.	12	11	1	-	-	9	2	1	-	12	-
	Geotechnical Engineering.	08	8	-	-	-	7	1	-	-	08	-
	Structural Engineering.	11	11	-	-	-	9	1	1	-	11	-
CSE	Computer Science & Engineering.	32	22	2	2	6	26	4	2	-	31	1
EE	Mach. Drives & Power Elect.	11	9	-	2	-	9	1	1	-	10	1
	Control System Engineering.	12	11	1	-	-	9	2	1	-	10	2
	Power System Engineering	12	10	-	1	1	10	2	-	-	11	1
	Instrumentation	12	11	-	-	1	10	2	-	-	11	1
E&ECE	Micro Electronic & VLSI Design (EC-2)	22	19	1	-	2	19	3	-	-	22	-
	RF & Microwave Engineering (EC-3)	14	10	1	2	1	11	1	2	-	14	-
	Telecomm. Systems Engineering (EC-4)	21	17	-	1	3	17	2	2	-	20	1
	Visual Infor. & Embedded System (EC-5)	18	16	1	1	-	14	2	2	-	15	3
CET	Media & Sound Engineering	05	5	-	-	-	5	-	-	-	5	-
GG	Earth & Environmental Sciences	09	9	-	-	-	7	1	1	-	7	2
	Computational Seismology	05	5	-	-	-	4	-	1	-	4	1
SIT	Information Technology	18	14	1	1	2	14	2	2	-	15	3
MA	Comp. Sc. & Data Processing	21	21	-	-	-	18	3	-	-	21	-
ME	Manufacturing Process Engineering.	25	23	-	-	2	19	4	2	-	25	-
	Thermal Energy & Environmental Engg.	27	25	-	-	2	22	3	2	-	27	-
	Mechanical System Design	22	17	2	2	1	17	4	1	-	22	-
	Mech. Sys. Dynamic & Control	17	14	-	-	3	13	3	1	-	17	-
MT	Metallurgical & Materials Engineering.	35	34	-	-	1	26	6	3	-	31	4
MI	Mining Engineering.	08	8	-	-	-	5	1	2	-	8	-
OE	Ocean Engineering & Naval Arch.	12	8	3	-	1	10	2	-	-	11	1
PH2	Solid State Technology	15	15	-	-	-	11	2	2	-	14	1
BT	Biotechnology & Biochemical	15	15	-	-	-	11	3	1	-	10	5
CR	Cryogenic Engineering.	16	16	-	-	-	14	2	-	-	16	-
HS	Hum. Resources Dev. & Management	18	16	1	1	-	15	2	1	-	15	3
IEM	Industrial Engineering & Management	19	18	-	1	-	15	2	2	-	17	2
RE	Reliability Engineering.	08	4	1	-	3	8	-	-	-	8	-
MS	Material Sc. & Engineering.	18	17	-	-	1	13	5	-	-	17	1
RT	Rubber Technology	15	14	-	-	1	13	2	-	-	13	2
VGSOM	Business Administration	121	-	121	-	-	91	19	7	4	97	24
SIT	Information Technology (PGDIT)	77	-	77	-	-	55	20	1	1	68	9
OE	Maritime Operation & Management.	05	-	5	-	-	4	1	-	-	5	-
SMST	Medical Science & Technology	09	09	-	-	-	8	-	-	1	7	2
VGSOM	PG Diploma in Business Administration	114	-	114	-	-	111	3	-	-	105	9
VGSOM	PG Diploma in Management	15	-	15	-	-	15	-	-	-	15	-
MT	PG Diploma in Steel Technology	21	-	21	-	-	21	-	-	-	21	-
CORAL		10	10	-	-	-	9	1	-	-	9	1
GSSST	PGDTNM	10	-	10	-	-	9	1	-	-	7	3
RGSOIPLLE	LLB (IPR)	39	-	39	-	-	37	2	-	-	31	8
RGSOIPL	PGDIPL	15	-	15	-	-	15	-	-	-	14	1
<b>Total</b>		<b>1140</b>	<b>659</b>	<b>433</b>	<b>14</b>	<b>34</b>	<b>947</b>	<b>134</b>	<b>53</b>	<b>6</b>	<b>1021</b>	<b>119</b>



**TABLE : B-2**  
**POSTGRADUATE STUDENTS ON ROLL**  
**1st year – 2006-2007 & 2<sup>nd</sup> year 2005-2006**

Dept./ Centre	Specialisation	Intake Capacity	1st Yr.		2 <sup>nd</sup> Yr		Total	
			M	F	M	F	M	F
AE	Aerospace Engineering.	14	14	1	7	2	21	3
AgFE	Farm Machinery & Power	90	15	-	13	-	28	-
	Soil & Water Conservation Engineering.		05	4	11	-	16	4
	Dairy & Food Engineering.		12	1	9	-	21	1
	Applied Botany		11	1	7	-	18	1
	Water Resource Development & Management		08	-	10	2	18	2
	Aquacultural Engineering.		4	1	9	1	13	2
	Agril. System & Management		6	2	8	2	14	4
	Post Harvest Engineering.		11	2	11	2	22	4
ARP	City Planning	25	15	9	17	7	32	16
ChE	Chemical Engineering.	50	46	5	38	2	84	7
Civil	Hydraulic & Water Resource Engineering	56	7	1	7	-	14	1
	Transportation Engineering.		10	-	7	-	17	-
	Environmental Engineering & Management		12	-	5	1	17	1
	Geo-Technical Engineering.		8	-	5	1	13	1
	Structural Engineering		11	-	14	-	25	-
CSE	Computer Science & Engineering	25	31	1	24	3	55	4
EE	Machine Drives & Power	45	10	1	9	1	19	2
	Electronics							
	Control System Engineering		10	2	9	1	19	3
	Power System Engineering		11	1	10	-	21	1
	Instrumentation		11	1	10	1	21	2
E&ECE	Auto & Computer Vision	67	-	-	11	1	11	1
	Fiber Optics & Lightwave Engineering		14	-	7	1	21	1
	Microelectronics & VLSI Design		22	-	-	-	22	-
	RF & Microwave Engineering		15	3	9	-	24	3
	Telecommunication Systems Engineering		20	1	16	1	36	2
GG	Earth & Environmental Science	21	7	2	9	2	16	4
	Computational Seismology		4	1	4	1	8	2
SIT	Information Technology	14	15	3	15	1	30	4
MA	Computer Science & Data Processing	21	21	-	20	4	41	4
ME	Manufacturing Process Engineering	79	25	-	15	1	40	1
	Thermal, Energy & Environmental Engineering.		27	-	12	-	39	-
	Mechanical System Design		22	-	15	-	37	-
	Manufacturing Systems Engineering		17	-	9	-	26	-
	Mechanical System Dynamics & Control		-	-	9	-	9	-

TABLE : B-2 (Continued)

Dept./ Centre	Specialisation	Intake Capacity	1st Yr.		2 <sup>nd</sup> Yr		Total	
			M	F	M	F	M	F
MT	Metallurgical & Materials Engineering	34	31	4	24	3	55	7
MI	Mining Engineering	14	8	-	8	-	16	-
OENA	Ocean Engineering & Naval Architecture	14	11	1	16	-	27	1
PH	Solid State Technology	14	14	1	10	2	24	3
BT	Biotechnology & Biochemical	14	10	5	5	6	15	11
CR	Cryogenic Engineering	14	16	-	8	-	24	-
HSS	Human Resources Development & Management	14	15	3	12	-	27	3
IEM	Industrial Engineering & Management	17	17	2	17	-	34	2
RE	Reliability Engineering	14	8	-	7	2	15	2
MS	Material Science & Engineering	17	17	1	9	6	26	7
RT	Rubber Technology	14	13	2	10	2	23	4
VGSOM	Business Administration	120	97	24	94	25	191	49
VGSOM	PGDBA	75	105	9	36	11	141	20
SIT	PG Diploma in Information Technology	90	68	9	71	8	139	17
OENA	Maritime Operation & Management	20	5	-	6	-	11	-
SMST	Medical Science & Technology	10	7	2	12	1	19	3
VGSOM	PG Diploma in Management	15	15	-	15	-	30	-
MT	PG Diploma in Steel Technology	18	21	-	18	-	39	-
CORAL	CORAL	10	9	1	-	-	9	1
RGSOIPL	LLB (IPR)	50	31	8	-	-	31	8
RGSOIPL	PGDIPL	75	14	1	14	1	28	2
CET	Media & Sound Engineering	10	5	-	-	-	5	-
GSST	PGDTNM	25	7	3	-	-	7	3
<b>Total</b>			<b>1021</b>	<b>119</b>	<b>783</b>	<b>105</b>	<b>1804</b>	<b>224</b>

**TABLE : B-3**STATEMENT OF RESULTS OF POSTGRADUATE EXAMINATION M.TECH / MCP / MBM  
2005-2006 BATCH OF STUDENTS

Dept./ Centre	Specialization	Number Registered	No. Declared Successful	No. of Incomplete Results	Remarks
AE	Aerospace Engineering.	9	9		
AG	Farm Machinery & Power	13	13		
	Soil & Water Conservation Engineering.	11	11		
	Dairy & Food Engineering.	9	9		
	Applied Botany	8	8		04AG6406 Old Batch
	Water Resource Devl. & Management	13	13		04AG6506 Old Batch
	Aquacultural Engineering.	9-	9		
	Agril. System & Management	10	10		
	Post Harvest Engineering.	13	13		
AR	City Planning	22	22		
CH	Chemical Engineering.	33	33		02CH6015 Old Batch
CE	Water Res. Engineering	7	7		
	Transportation Engineering.	7	7		
	Environmental Engineering & Management	5	5		04CE6401
	Geo-Technical Engineering.	6	6		04CE6503& 04CE6508
CS	Structural Engineering	15	15		
	Comp. & Information Tech.	27	27		04CS6008& 04CS6014
EE	Mach. Drives & Power	9	9		
	Electronics				
	Control System Engineering	13	13		04EE6202, 04EE6208, 04EE6212
	Power System Engineering	13	13		
	Instrumentation	8	8		
E&ECE	Auto & Computer Vision	11	11		
	Computer Engineering.	1	1		03ECE6213
	Fiber Optics & Lightwave Engineering	7	7		
	Microelectronics & VLSI Design	15	14	05EC6415	04ECE6401
	RF & Microwave Engineering	9	9		
	Telecommunication	17	17		
	Systems Engineering				
GG	Earth & Environmental Sciences	9	9		
	Computational Seismology	5	5		
SIT	Information Technology	16	16		04IT6004 (Old Batch)
MA	Computer Science & Data Processing	22	22		

TABLE : B-3 (Continued)

Dept./ Centre	Specialization	Number Registered	No. Declared Successful	No. of Incomplete Results	Remarks
ME	Manufacturing Process Engineering	13	13		
	Thermal, Energy & Environmental Engg.	10	10		
	Mechanical System Design	12	12		
	Manufacturing System Engineering	-	-		
	Mech. Handling & Auto. Precision & Quality Engineering	-	-		
	Mech. Sys. Dynamics & Control	8	8		04ME6703 Old Batch
MT	Metallurgical & Materials Engineering	269	26		02MT6003, 03MT6001, 03MT6002, 04MT6003, 04MT6014
MI	Mining Engineering.	8	8		03MI6009, 03MI6011
NA	Ocean Engineering & Naval Architecture	14	14		
PH	Atmospheric Science & Technology	-	-		
	Solid State Technology	11	11		
BT	Biotechnology & Biochemical	9	9		
CR	Cryogenic Engineering.	7	7		
HS	Hum. Resources. Dev. & Management	9	9		
IM	Industrial Engineering & Management	15	15		
RE	Reliability Engineering	10	10		04RE6005, 04RE6011
MS	Materials Science & Engineering	15	15		
RTC	Rubber Technology	10	10		
VGSOM	Business Administration	117	117		
PGDIT	Information Technology	74	70	06IT5333, 06IT5514, 06IT5529, 06IT5532	05IT5304
MMST	Medical Science & Technology	9	8	04MM6013	
PGDMOM	Maritime Operation & Management	5	5		
VGSOM	PG Diploma in Business Administration	35	34	05BM5102	
VGSOM	PG Diploma in Management	15	15		
MT	PG Diploma in Steel Technology	21	21		
GSSST	PGTNM	10	10		
<b>Total</b>		<b>833</b>	<b>826</b>	<b>07</b>	<b>25</b>

**TABLE : C-1****NUMBER OF RESEARCH SCHOLARS ENROLLED FOR THE PH.D. DEGREE DURING 2006-2007**

Deptt./Centre School	Institute Scholar	Sponsored Scholar	Scheme/FN/QIP	Self-financing	Teach./Non-teaching	Total	Genl.	SC	ST	M	F
AE	02	02	03	-	-	07	05	01	01	07	-
AG	06	05	06	-	-	17	15	02	-	14	03
AR	-	-	-	-	-	-	-	-	-	-	-
BT	02	-	10	-	-	12	11	01	-	10	02
CY	05	-	17	-	-	22	21	01	-	17	05
CH	01	01	05	-	-	07	07	-	-	05	02
CE	04	01	02	-	-	07	06	01	-	05	02
CS	04	03	06	-	-	13	13	-	-	12	01
CR	02	-	-	-	-	02	02	-	-	02	-
CET	02	-	-	-	-	02	02	-	-	01	01
EE	07	-	05	-	-	12	12	-	-	11	01
EC	05	05	05	-	-	15	15	-	-	13	02
GG	04	-	03	-	-	07	07	-	-	03	04
GSSST	03	03	-	-	-	06	04	02	-	05	01
HS	04	04	-	01	-	09	09	-	-	05	04
IM	01	02	03	-	-	06	06	-	-	06	-
MS	04	-	03	-	-	07	07	-	-	04	03
MA	05	-	04	-	-	09	09	-	-	06	03
ME	10	02	05	-	-	17	15	01	01	17	-
MT	03	04	03	-	-	10	09	01	-	10	-
MI	-	01	03	-	-	04	04	-	-	04	-
NA	01	-	-	-	-	01	01	-	-	01	-
PH	11	01	05	-	-	17	16	01	-	15	02
RE	-	-	02	-	-	02	02	-	-	02	-
RT	01	01	07	-	-	09	09	-	-	06	03
RD	01	-	-	-	-	01	01	-	-	01	-
SMST	04	-	04	01	-	09	09	-	-	08	01
SIT	-	-	04	-	-	04	04	-	-	03	01
VGSOM	-	02	-	02	-	04	04	-	-	03	01
<b>TOTAL</b>	<b>92</b>	<b>37</b>	<b>105</b>	<b>04</b>	<b>-</b>	<b>238</b>	<b>225</b>	<b>11</b>	<b>02</b>	<b>196</b>	<b>42</b>

**TABLE : C-2****NUMBER OF MS STUDENTS ENROLLED DURING 2006-2007**

Deptt./Centre/ School	Total	Genl.	SC	ST	Male	Female
AE	01	01	-	-	01	-
CS	06	06	-	-	06	-
CH	01	01	-	-	01	-
CE	01	01	-	-	01	-
EE	02	02	-	-	02	-
EC	09	09	-	-	05	04
GSSST	02	02	-	-	01	01
IM	02	02	-	-	-	02
MI	06	06	-	-	06	-
SIT	01	01	-	-	01	-
TOTAL	31	31	-	-	24	07

**TABLE : C-3****NUMBER OF POST DOCTORAL FELLOWS AS ON 30-06-2007**

NIL

**TABLE : C-4 (A)****UGC SCHOLARS AS ON 30.06.2007**

Dept/Centre/School	Total Number	Genl.	SC	ST	Male	Female
AG	02	02	-	-	01	01
BT	08	07	01	-	06	02
CY	14	13	01	-	12	02
GG	02	02	-	-	01	01
HS	01	01	-	-	01	-
MI	01	01	-	-	01	-
MS	03	03	-	-	02	01
MA	05	05	-	-	04	01
PH	02	02	-	-	02	-
TOTAL	38	36	02	-	30	08

**TABLE : C-4 (B)****UGC POST DOCTORAL FELLOWS AS ON 30.06.2007**

NIL

**TABLE : C-5****NUMBER OF RESEARCH SCHOLARS FROM OTHER COUNTRIES**

NIL

**TABLE : C-6****NAMES OF THE PH.D. DEGREE RECIPIENTS**

Aerospace Engineering	Ashutosh Kumar, Chinmay Kumar Kundu, Shuvendu Narayan Patel
Agricultural & Food Engineering	Rejani R., Vijay Kumar Tiwari, Dibyendu Kamilya, Anannya Banga, Sujata Jena, Damodhara Rao Mailapalli, Susmita Patnaik, Ghadge Shashi Kant Vilas, Saroj Kumar Giri, Shashwati Ghosh, Mithu Das, Manoj Kumar Chourasia, Pramod Rai, Devesh Pandey, Asif Umer Pagarkar, Amit Nath, Sangeeta Negi, Alivia Chowdhury, V. Sathya Sai Prasad
Architecture & Regional Planning	Abir Bandyopadhyay, Joy Sen
Biotechnology	Monalee Saha, Nandita Mishra, Kaushik Nath, Chavali Venkata Ramana Murthy
Chemical Engineering	Sanghamitra Barman, Dhurjati Prasad Chakrabarti, Vaibhav Vasant Goud, Sunil Kumar Maity
Chemistry	Sk. Anwarul Haque, Manindra Nath Bera, Krishnamoorthi S., Sudip Nath, Ashok Kumar Mohanty, Asit Patra, Jaya Prakash Das, Niranjan Panda, Satyajit Dey, Sandip Kumar Roy, Chandi Charan Mandal, Pranab Halder, Sulagna Brahma, Paromita Debroy, Moloy Banerjee, Anjan Chakraborty, Jnanojjal Chanda, Tapas Ranjan Kunor, Braja Narayan Patra, Joyanta Choudhury, Ananta Karmakar, Kumar Sidhartha Kesav Varadwaj, Dibyendu Khatua, Prasanta Kumar Nanda, Madhushree Sarkar, Poulomi Roy, Bidyut Kumar Senapati, Sudipa Panigrahi, Bishnupada Dutta, Indrajit Das, Alok Ranjan Paital
Civil Engineering	Rajkumar Venkatesh Raikar, Umesh Kumar Dewangan, Dipanjana Maulik, Anirban Mandal, Ashok Kumar Mishra, Soumendra Nath Kuiry, Kakoli Karar
Computer Science & Engineering	A.Vadivel, Hemanta Kumar Pati, Tathagato Rai Dastidar, Debdeep Mukhopadhyay, Philip Samuel, Devshri Roy
Electrical Engineering	Soumya Ranjan Mohanty, Partha Sarathi Bera, Karabi Biswas, Bibhu Prasad Panigrahi, Jayati Dey, Arpita Sinha, Ardhendu Saha
Electronics & Electrical Communication Engineering	Anil Kumar Tiwari, Gautam Kumar Mahanti, Kumar Padmanabh, Somnath Chandra, Kolekar Maheshkumar Hanmant
Geology & Geophysics	Pankaj Kumar Srivastava, Koushik Sen, Sadhana Mahato, Amit Basu Sarbadhikari, Ajoy Kumar Bhaumik, Shantanu Kumar Dutta
Humanities & Social Sciences	Soumendu Biswas, Tanuka Roy, Anamitra Basu, Jaison A. Manjaly, Bipasha Maity, Siddhartha Sankar Brahma
Industrial Engineering & Management	Virupaxi Bagodi, Ajothya Nath Das, Ranjit Kumar Das, Rajib Kumar Mohapatra, Indrajit Mukherjee
Materials Science	Kalyani Mohanta, Mamata Pradhan, Shiva Kumar E, Sushanta Kumar Kamilla, Chaganti Srinivasa Reddy, Swatilekha Das
Mathematics	Yogesh Mani Tripathi, Chandan Chakraborty, Abhijit Datta Banik, Gour Chandra Mahata, R. Balavenkata Subramanyam, Debdas Mishra, Subarna Bhattacharjee, Motilal Panigrahi, Pankaj Dutta
Mechanical Engineering	Jahar Sarkar, Saroj Kumar Sarangi, Subrata Kumar, Chinmaya Kar, Prasanta Kumar Satapathy, Sudipto Ray, Sanjoy Kumar Ghoshal, Dattatraya V. Patil, Birajashis Pattnaik, Vommi Vijaya Babu, Ram Naresh Rai, Achintya Kumar Pramanick, Prasanth Kumar R, Abdusamad Alias Salih
Metallurgical & Materials Engineering	K. Ram Mohan Rao, Asit Kumar Khanra, Sheela Singh, Narendranath S., Sanjeev Das, Monideepa Mukherjee, Payodhar Padhi, B. Ramesh Chandra, Rajat Kumar Roy, A.K. Prasada Rao, Anindya Basu, Anil Kumar Verma
Mining Engineering	Abhiram Kumar Verma, Subir Kumar Mukhopadhyay, P. Mallikarjun Rao, Snehamoy Chatterjee, Sanjay Kumar Palei
Ocean Engineering & Naval Architecture	Ranadev Datta
Physics & Meteorology	Achintya Singha, Sourabh Mukhopadhyay, Ratna Koley, Biswajit Pandey, Sujay Kumar Singh Parashar, Susanta Kumar Das, Aparna Roy, Bhaskar Kaviraj, Kaustuv Das
Reliability Engineering	Sasatte Pravinkumar Vishwanath
Rubber Technology	Rajatendu Sengupta, Mohanraj G.T., V. Sridhar, Shyama Prasad Mahapatra
School of Information Technology	Subhagata Chattopadhyay

**TABLE : C-7****NAMES OF THE MS DEGREE RECIPIENTS**

Computer Science & Engineering	Sanjay Chatterjee, Suman Kundu, Roshni Chatterjee, Anirban Lahiri, Anupam Chakraborty, Soumyajit Dey
Electrical Engineering	Jitendra Kumar Agrawal, Abhijit Das, Goutam Maji, Siddhartha Swarnakar, Pradipta Patra
Electronics & Electrical Communication Engineering	Joydeep Bhattacharyya, Amlan Ghosh, Koushik De, Anindya Hazra, Narender Kumar, Rajib Mahapatra, Kamal V., Kanishka Prabhat Biswas, Anirban Dhar, Debasis Sarkar
Mechanical Engineering	Arup Kumar Das, Angshuman Chattopadhyay, Sumit Basu, Debabrata Dasgupta, Saumya Sankar Adhikari
Metallurgical & Materials Engineering	S. Muthu Kumar, Ganesan S. M., Swapan Kumar Karak, Sankalp
Ocean Engineering & Naval Architecture	Saumya Sengupta, Amit Tyagi, Subhendu Maity
School of Information Technology	Vaskar Raychoudhury
Vinod Gupta School of Management	Devesh Mishra



**INDIAN INSTITUTE OF TECHNOLOGY  
KHARAGPUR**

**RECEIPT AND PAYMENT ACCOUNT FOR THE YEAR ENDED 2006-2007**

SL. NO.	R E C E I P T S	A M O U N T (Rs.)	SL. NO.	P A Y M E N T S	A M O U N T (Rs.)
I	<b>Opening Balance (Bank Balances)</b>		I	<b>EXPENSES</b>	
	a) In Current accounts	191965570.00		a) Establishment Expenses	723525611.00
	b) In deposit accounts	0.00		b) Administrative Expenses	253122536.00
	c) In Savings accounts	32505429.00			
II	<b>Grants Received From Govt. of India</b>		II	<b>Payments made against funds from various projects</b>	
	a) Non-Recurring (Plan)	645000000.00			
	b) Recurring (Non-Plan)	700000000.00			
III	<b>Income on Investments from</b>		III	<b>Investments and deposits made</b>	
	a) Earmarked / Endowment Fund	40602822.00		a) Out of Earmarked / Endowment funds	755326481.00
	b) Instt. Development Fund	19012400.00		b) Out of Instt. Dev. Fund	200578768.00
	c) Own funds	7435018.00		c) Out of Own Funds & Others	2001698005.00
IV	<b>Interest Received</b>		IV	<b>Expenditure on Fixed Assets &amp; Capital Work-in-progress</b>	528090814.00
	a) On Bank deposits	68722.00			
	b) Recoverable Advances	2618265.00			
V	<b>Other Income</b>	150232986.00	V	<b>Refund of surplus money / Loans</b>	
				a) To the Govt. of India	
				b) To the State Government	
				c) To other providers of funds	
VI	<b>Amount Borrowed</b>	190000000.00	VI	<b>Finance charges (Interest)</b>	
VII	<b>Other Receipts</b>	3234223952.00	VII	<b>Other Payments</b>	499991949.00
			VIII	<b>Closing Balances</b>	
				a) In current accounts	202996074.00
				b) In savings accounts	48334926.00
<b>TOTAL</b>		<b>5213665164.00</b>	<b>TOTAL</b>		<b>5213665164.00</b>

# **PART - II**

**CENTRALIZED UNITS AND  
SERVICES & ALUMNI AFFAIRS &  
INTERNATIONAL RELATIONS**

## ALUMNI AFFAIRS & INTERNATIONAL RELATIONS

**DEAN : Professor Ajay Chakrabarty**

**Alumni Affairs & IR Committee :**

**Professor-in-Charge, Information Cell**

Prof. B. K. Mathur                      Department of Physics & Meteorology

**Chief Editor & Professor-in-Charge of News Letters / Publications**

Prof. Jayanta Bhattacharyya        Department of Mining Engineering

**Professors-in-Charge of Alumni Affairs**

Prof. G. Bandyopadhyay	Department of Aerospace Engineering
Prof. V. K. Tewari	Department of Agriculture & Food Engineering
Prof. Joy Sen	Department of Architecture & Regional Planning
Prof. D. D. Kar	Department of Chemical Engineering
Prof. S. Dey	Department of Biotechnology
Prof. S. K. Srivastava	Department of Chemistry
Prof. J. N. Bandyopadhyay	Department of Civil Engineering
Prof. P. P. Chakrabarty	Department of Computer Science & Engineering
Prof. Kanchan Chowdhury	Cryogenic Engineering Centre
Prof. A. Patra	Department of Electrical Engineering
Prof. T. S. Lamba	Department of Electronics & Electrical Communication Engineering
Prof. B. Mishra	Department of Geology & Geophysics
Prof. V. N. Giri	Department of Humanities & Social Sciences
Prof. R. N. Banerjee	Department of Industrial Engineering & Management
Prof. Debashis Bhattacharya	Materials Science Centre
Prof. A. R. Roy	Department of Mathematics
Prof. A. R. Mohanty	Department of Mechanical Engineering
Prof. R. Mitra	Department of Metallurgical & Materials Engineering
Prof. B. S. Sastry	Department of Mining Engineering
Prof. D. Sen	Department of Ocean Engineering & Naval Architecture
Prof. S. Bharadwaj	Department of Physics & Meteorology
Prof. Nikhil Singha	Rubber Technology Centre
Prof. S. C. Mahapatra	Rural Development Centre
Prof. Prabina Rajib	Vinod Gupta School of Management

The various activities of the office of the Dean (AA&IR) over the past one year are as follows :

## ACTIVITIES RELATED TO ALUMNI AFFAIRS

- An extremely popular alumni newsletter “KGPian” is being published regularly every three months. The first issue was published in October 2003. Till date 16 issues have been published.
- Distinguished Alumnus Award was conferred on alumni of IIT Kharagpur who have distinguished themselves in their own domain of work and made the alma mater proud during the 53rd Annual Convocation. Professor Supriyo Dutta, Prof. Prithviraj Banerjee, Prof. Surendra Prasad, Dr. Kirit S. Parikh and Prof. Panjab Singh were honoured with the award.
- A brochure named “IIT Kharagpur over the years” was published by the Technology Alumni Association on the occasion of the 53rd Annual Convocation.
- Prof. Madhusudan Chakraborty, Deputy Director and Prof. A. Chakrabarty, Dean (AA&IR) have been meeting alumni all over the globe over the past one year to promote the alumni activities :
  - Kolkata Alumni Chapter organized a dinner meeting in Calcutta Club on November 11, 2006 to felicitate Prof. Madhusudan Chakraborty and Prof. Ajay Chakrabarty for taking up their new assignments as Deputy Director and Dean (AA&IR).
  - Prof. Madhusudan Chakraborty, Deputy Director and Prof. Ajay Chakrabarty, Dean (AA&IR) participated in the **PanIIT 2006 Global Conference**, held at Bandra Kurla Complex, Mumbai during December 23-25, 2006 as the representatives of IIT Kharagpur.
  - Prof. Madhusudan Chakraborty, Deputy Director, Prof. Ajay Chakrabarty, Dean (AA&IR), Dr. Dhruvish Biswas, Chief Technology Officer, SRIC and Mr. Kallol Mallick, Project Officer / Student Entrepreneur of IIT Kharagpur attended “**PAN-IIT 2007 Global Conference**” held in San Jose, USA during July 06-08, 2007. Mr. Roy Da Silva, President of Alumni Foundation (USA) was the main organizer. Some of our summer interns at University of Southern California, USA have also joined in that global conference. Prof. Ajay Chakrabarty and Dr. Dhruvish Biswas participated in the **Google and Yahoo Research Outsourcing Programs** held on July 05, 2007 at San Jose, USA to represent IIT Kharagpur and shared their collective experience, knowledge and wisdom with the alumni and other dignitaries across the globe. One of our successful entrepreneurs, Mr. Kallol Mallick from Technology Incubation and Entrepreneurs Training Society incubation participated in a panel discussion along with Prof. Dhruvish Biswas. They explained incubation process in IIT Kharagpur starting from ideation, pre-incubation and formal incubation leading to the eventual enterprise formation. Mr. Mallick skillfully connected with his mentor Prof. Biswas, the process through the AZURE (his Company) case study and set an example for other IITians to initiate such process for their own Institute. IIT Kharagpur had put an impressive booth displaying its technologies, its entrepreneurship programs, and the spirit of the alumni’s relations. It helps to proactive image of IIT Kharagpur in securing in traction with its alumni and public at large.
  - Prof. Ajay Chakrabarty, Dean (AA&IR) visited USA by accepting invitation to attend the **Indo-US Collaboration on Engineering Education (IUCEE)**, held in Washington DC, USA during the period from August 29–31, 2007. This Forum was organized to improve the quality and global relevance of engineering education in US and in India through collaborations. Prof. Chakrabarty delivered a lecture on “**Research and Development**” in the breakout session of that Forum.
  - Our alumnus, Prof. Asit K. Biswas, President & Academician, Third World Centre for Water Management, Atizapan, Mexico and the recipient of prestigious World Water Prize for 2006, was conferred Distinguished Alumnus Award 2006 in 4<sup>th</sup> Annual Alumni Meet held on January 06-07, 2007 for his outstanding work on *Water Management in the 21<sup>st</sup> Century for the Developing World*.

- Southeast Asia and Taiwan Universities (SATU) Presidents' Forum, led by their President Dr. Michael Ming-Chiao Lai and three others visited IIT Kharagpur on June 11, 2007. They met with the then Director, Prof. S. K. Dube and invited our Director in its **Annual Steering Committee Meeting** to be held at Mahidol University, Thailand from during November 18-20, 2007.
  - Dr. M. Rezwan Khan, Vice-Chancellor, Prof. Dr. Chowdhury Mofizur Rahman, Pro-VC and Prof. Dr. Habibur Rahman, Dean, School of Business of United International University (UIU), Dhaka, Bangladesh visited IIT Kharagpur on April 30, 2007 and discussed regarding the possible collaboration between IIT Kharagpur and UIU.
- The New Year brought together the alumni of the Institute again for the fourth time to IIT in the form of **4<sup>th</sup> Annual Alumni Meet 2007** held during January 06-07, 2007. The Meet was, however, dedicated to those who graduated in the years 1957 and 1982. Out of 320 alumni who had registered and confirmed their participation, about 260 including 80 from within IIT Kharagpur attended the Meet. Prof. Asit K. Biswas, President & Academician, Third World Centre for Water Management, Atizapan, Mexico and the recipient of prestigious World Water Prize for 2006, was conferred Distinguished Alumnus Award 2006. Many alumni came with their spouses and some with children and even grand children. The total number of attendees was more than 500. The visiting alumni along with their spouses and children were accommodated in Technology Guesthouse, Alumni Guesthouse, CEC Guesthouse and Vikram Sarabhai Residential Complex. In order to meet part of the expenses as well as to commemorate the occasion we brought out a Souvenir, "Yearning of Yore – Volume IV". The programme consisted of Inauguration, Award Giving Ceremony, Panel Discussion, Alumni General Meeting, Departmental Reunion, Hall Reunion, Sight Seeing Programme, Sports Events and Cultural Programme. The topic of the Panel Discussion was "IIT Kharagpur 50 years hence". The panelists were Prof. Asit K. Biswas, Prof. K. C. Sahu, Prof. J. N. D. Gupta, Mr. Tan Lee, Mr. Ambar Sinha and Dr. V. P. Sandlas and the moderator was Dr. K. G. Narayan.

#### ACTIVITIES RELATED TO INTERNATIONAL RELATIONS

##### ➤ MOUs signed

- MOU between National Rural Roads Development Agency and IIT Kharagpur – Signed on September 07, 2006
- MOU between Virginia Commonwealth University and IIT Kharagpur - Signed on October 09, 2006
- MOU between IIT Kharagpur and Headquarters Integrated Defence Staff, Ministry of Defence, Government of India for setting up 'Centre of Excellence on Information Assurance' (CEIA) – Signed on October 23, 2006
- MOU between UNIVERSITI TEKNOLOGI MARA, MALAYSIA and IIT Kharagpur – Signed on November 08, 2006
- MOU between Govt. of India, Board of Research in Nuclear Sciences, Department of Atomic Energy (DAE), Bhabha Atomic Research Centre, Mumbai - 400 085 and Govt. of India, Bhabha Atomic Research Centre (BARC), Department of Atomic Energy (DAE), Mumbai – 400 085 and Indian Institute of Technology, Kharagpur – Signed on November 16, 2006
- MOU between IIT Kharagpur and Indian Institute of Science Education & Research (IISER), Kolkata – Signed on December 18, 2006
- MOU between IIT Kharagpur and Ministry of Earth Sciences (MoES) – Signed on December 18, 2006

- MOU between IIT Kharagpur and Santech Communication Pvt. Ltd., Kolkata – Signed on January 13, 2007
- MOU between IIT Kharagpur and Sanjay Gandhi Postgraduate Institute of Medical Sciences (SGPGIMS), Lucknow – Signed on January 15, 2007
- MOU between Universita degli Studi di Roma “La Sapienza”, Italy and IIT Kharagpur – Signed on May 04, 2007
- Cooperative Research and Development Agreement between the University of Massachusetts School of Marine Sciences (UMSMS) and IIT Kharagpur – Signed on May 10, 2007
- MOU between the Ryukoku University, Japan & IIT Kharagpur – Signed on May 10, 2007

➤ **Visit from partner institutions**

Some of the recent visits of alumni are as follows:

- Prof. Prith Banerjee, who was Dean, College of Engineering, University of Illinois at Chicago, now Senior Vice President, Research and Director, HP Labs, Hewlett Packard Company, California visited IIT Kharagpur on December 29, 2006 and made a draft MOU between IIT Kharagpur and UIC.
- Mr. Vinod Gupta, founder of Vinod Gupta School of Management, visited IIT Kharagpur at the end of November 2006.
- Prof. Avijit Gangopadhyay, Dean and Professor, School of Marine Science and Technology, University of Massachusetts at Dartmouth, USA visited IIT Kharagpur during May 09-10, 2007 and signed a MOU between the UMSMS and IIT Khargpur.
- Mr. Arjun Malhotra visited IIT Kharagpur during May 10-11, 2007 and discussed to formulate a well-charted plan for R&D activities that will ensure visibility of our 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.

## ADVANCED TECHNOLOGY DEVELOPMENT CENTRE

**CHAIRMAN : Professor Santiram Kal**

### FACULTY ASSOCIATED

#### Professor :

Kal, S., E&ECE	M.Sc., Ph.D., Microelectronics, MEMS, Thin film processing
Sengupta, S., E&ECE	Ph.D., Computer vision, Multimedia
Patra, A., EE	Ph.D., VLSI Design of Power Converters, Industrial Information Technology
Basu, A., CSE	Ph.D., Embedded Systems, Artificial Intelligence application
Banerjee, S., EE	Ph.D., Bifurcation Theory, Chaos, Nonlinear Dynamics
Roy, S. K., Physics	M.Tech., Ph.D., Solid State Physics, thin film, nanotechnology
Pal, S. P., CSE	M. Tech., Ph.D., Computational geometry, Design and analysis of algorithms
Manna, I., MME	Ph.D., Corrosion and Surface Protection, Phase Transformation, Nano-cermet, Physical Metallurgy, Surface Engineering, Wear of Metals
Chakraborty, P. P., CSE	Ph.D., Artificial Intelligence, CAD for VLSI Design of Algorithms, Formal Verification
Bhattacharya, S., CE	Ph.D., Structural Engineering
Ghosh, A., BT	Ph.D., Virology and Molecular Biology
Basak, A., Chemistry	Ph.D., Bioorganic Chemistry
Dey, S., BT	Ph.D., Microbial and Plant Biotechnology

#### Senior Scientific Officer :

Gangopadhyay, Pranabendu,	M.Sc. (Tech.), Ph.D., Integrated Optics, Optical Metrology, Fiber Optics, MOEMS, Microelectronics.
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### 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 :**

Inertial MEMS,  
 Micro Sensors and actuators for automobile,  
 Space and defense applications,  
 Bio-MEMS,  
 Semiconductor devices,  
 Nanotechnology,  
 Lithium niobate integrated optics,  
 Astrophysics,  
 Cosmology,  
 Nonlinear Sciences,  
 Theoretical condensed matter physics,  
 Wireless communication and Baseband processing,  
 Analog and RF circuits,  
 Plant biotechnology.

**New Acquisitions :**

MEMS vaporising liquid microthruster, MEMS flow sensors, Integrated-optic switch, MEMS accelerometer for aircraft motion sensing,  
 Wafer aligner and substrate bonding machine for MEMS packaging,  
 LPCVD Furnace,  
 Tempress Systems,  
 Infrared Camera for Integrated-Optic applications.

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects :**

#	Title of the project	Sponsor(s)	Duration
1.	Design Centre for MEMS devices	NPSM, Govt.of India	2001 – 2006
2.	Indo-US Joint Centre on Advanced and Futuristic Manufacturing	Indo-US Science & Tech. Forum,	Ongoing
3.	Development of Silicon Microsensors for Flow Measurement	MHRD, New Delhi	Ongoing
4.	Design, analysis and optimization of navigation grade silicon based MEMS accelerometer	ISRO-KCSTC cell	Ongoing
5.	Development of micromachined inertial and flow sensors for environmental/ biomedical application	DST, New Delhi	2004 – 2006

6.	MEMS technology for micromachined silicon microsensors.	DRDO, New Delhi	2002 – 2007
7.	Nanoscience and Technology – Mission oriented project	IIT Kharagpur	2003 – 2007
8.	Complex engineering – Mission project	IIT Kharagpur	2003 – 2007
9.	Design and fabrication of high sensitivity micromachined silicon tunneling accelerometer with $\mu$ -g resolution	ISRO	2005 – 2006
10.	Indo-US joint centre on advanced and futuristic manufacturing	Indo-US Science & Technology Forum	2006 – 2008
11.	MEMS based micro-propulsion devices for micro-satellite programme	ISRO	2007 – 2010
12.	Multi-scale modeling to study the role of atomic scale defects in CNT-based nanocomposites	DST, New Delhi	2007 – 2009
13.	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	CSIR, New Delhi	2006 – 2009
14.	Kinematics of flows in diverse contexts	DST, New Delhi	2006 – 2009
15.	Measuring the HI power spectrum with the GMRT	BRNS, DAE, Mumbai	2007 – 2010
16.	Targeted gene integration in rice and cotton	National Fund for Basic Science, ICAR	On-going
17.	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
18.	Application of technology for tomato hybrid seed industry involving rural women for employment and income generation	DST, New Delhi	On-going
19.	Recombinant DNA for development of a male-sterility system in jute.	DBT, New Delhi	On-going
20.	Generation and cataloguing of bast fibre developmental stage specific EST library from jute	DBT, New Delhi	On-going

#### Consultancy Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Development of Fast Bipolar ASIC Chips	BARC	On-going
2.	Development and realization of high Q-factor quartz double ended tuning forks using micromachining technology	ISRO-IISU	On-going

#### **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. Kal University of Illinois at Urbana Champaign, USA, 2006.
4. Prof. S. Kal Forshung Zentrum Karlsruhe (FZK), Karlsruhe, Germany, June 01-02, 2006.
5. Prof. S. K. Ray Visiting Professor, Tokyo Institute of Technology, May-June, 2007
6. Prof. S. K. Ray National University of Singapore, July 03, 2007
7. Prof. T. K. Bhattacharya University of Utah, Saltlake City, USA, 2006
8. Prof. T. K. Bhattacharya MIT, USA, 2006
9. Prof. T. K. Bhattacharya Visited Tudelft, Netherland, 2006
10. Prof. T. K. Bhattacharya University of Paria, Italy, 2006.

#### **LECTURE BY VISITING EXPERT**

1. Prof. Y. B. Gianchandani, University of Michigan, Ann Arbor, USA "Microsystem research at Michigan University", at ATDC, IIT Kharagpur, July 18, 2007
2. Dr. S. Nettikadan, Director of Research & Application Development, Bioforce Nanoscience, Ames, IA 50010, USA. "Nano enabler system-its various applications in nanobiotechnology", ATDC, IIT Kharagpur, February 26, 2007.

#### **INVITED LECTURES BY FACULTY MEMBERS**

1. Prof. S. K. Lahiri IOSIMM : an integrated optic simulator, IEEE LEOS seminar, Radio Physics & Electronics, Calcutta University (2006)
2. Prof. S. Kal MEMS Inertial Sensors for avionics and Space Applications, Forschung Zentrum, Karlsruhe, Germany (2006)
3. Prof. S. Kal MEMS Inertial Sensors for Avoinics at University of Illinois at Urbana Champaign, USA (2006)
4. Prof. S. Kal MEMS inertial sensors for Avonics and Space Applications, in the workshop on MEMS and MICROSYSTEMS, IIT Kharagpur (May 28 – June 02, 2007).
5. Prof. T. K. Bhattarcharya Microfabrication of CMOS compatible tunneling accelerometer with sub  $\mu\text{g}$  resolution, Tokyo, Japan (2006)
6. Prof. T. K. Bhattarcharya High precision tunneling accelerometer and its wireless integration, National Semiconductor Corporation, San Jose, USA (2006)
7. Prof. T. K. Bhattarcharya Wireless integrated microsensors, University of Twente, Netherlands (2006)

8. Prof. S. K. Ray Nanofabrication for Novel Electronic Devices, Institute of Radiophysics & Electronics, University of Calcutta (2006)
9. Prof. S. K. Ray SiGe Heterostructure Devices, Solid State Physics Laboratory, New Delhi (2006)
10. Prof. S. K. Ray Semiconductor Nanostructures for Memory & Sensing Devices, DAE-BRNS Theme Meeting on Nanostructured Coating for Tribological and Sensor Applications, Kolkata (2006)
11. Prof. S. K. Ray Nanoelectronic Devices, National Institute of Science & Technology, Orissa (2006)
12. Prof. S. K. Ray Semiconductor Nanostructures, Tokyo Institute of Technology (May 10, 2007)
13. Prof. S. K. Ray Ge nanostructures for electronic & optical devices” CAT Indore, (April 30, 2007)
14. Prof. S. K. Ray Nanostructured Semiconductors SGITS, Indore , Recent Trends in Nanotechnology, (April 29, 2007)
15. Prof. S. K. Ray Self-assembled Ge Islands for Silicon Based Nanoscale Devices” International Conference on Recent Trends in Nanoscience & Technology, Jadavpur University, (December 09, 2006)
16. Prof. S. K. Ray MBE Growth of Strained Layer SiGe Heterostructures & Self-assembled Ge Islands, A national workshop on Roadmapping of Advanced Heterostructures, Kolkata, (December 19, 2006)
17. Dr. S. Das Quartz micromachining for MEMS applications, and Development of silicon microthruster for micro-satellite application, in the workshop on MEMS and MICROSYSTEMS, IIT Kharagpur (May 28 – June 02, 2007)
18. Dr. P. Gangopadhyay Lithium niobate integrated optics : modeling and experiments, in the workshop on MEMS and MICROSYSTEMS, IIT Kharagpur (May 28 – June 02, 2007)

#### BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	Prof. Sudebkumar P. Pal and Prof. Somesh Kumar	Quantum Information, Computation and Communication	Allied Publishers Private Ltd.	2007

#### 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

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

1. QIP Workshop on MEMS and MICROSYSTEMS May 28 – June 02, 2007
2. International workshop on MEMS and Micro / Nano systems technology for Bio-implants and Bio-applications (IWMNST-06) December 28-30, 2006

**ADDITIONAL INFORMATION**

**Collaborative Efforts :**

1. A joint collaboration research project on "Development of micromechanical inertial and flow sensors for environmental / biomedical application" sponsored by DST, Govt. of India in going on under an Indo-Italian research programme. (ITPAR). Collaborating Institute - ITC - irst. Trento, Italy
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 :**

KGPIFS1	Debashis Mandal and Prof. T K Bhattacharyya	Integer N Frequency Synthesizer (Phase-II)
KGPIFS2	Debashis Mandal and Prof. T K Bhattacharyya	Integer N Frequency Synthesizer (Phase-III)
KGPHFOPAMP	Amal Kundu, Debashis Mandal and Prof. T K Bhattacharyya	UWB OPAMP (Phase-II), High capacitive load drive OPAMP
KGPLPRX	Ashudeb Dutta, Prabir Saha, Debashis Mandal and Prof. T K Bhattacharyya	1 Volt Radio receiver system
KGPQVCO	Prabir Saha and Prof. T K Bhattacharyya	1V Quadrature VCO
KGPHFSA	Ashis Maity & Prof. Amit Patra	High frequency Buck Converter
KGPHFSB	Ashis Maity & Prof. Amit Patra	High frequency Buck Converter
KGPHFSC	Ashis Maity & Prof. Amit Patra	High frequency Buck Converter
KGPEMC	Rupam Mukherjee, Prof. Soumitra Banerjee	Choas Modulated Clock Generator, DC DC Converter
KGPADC07	Sounak Roy, Sanjay Kr Dey, Santunu Sarkar, and Prof. Swapna Banerjee	Blocks of pipeline ADC
KGPLLQVI	Sourav Bannerjee, Prof. Pradip Mandal	Transimpedance amplifier & Equalizer for opt. Fiber
ICPO15	Sougata Kr. Kar, S.Pandit, Prof. S. San	ASIC for capacitive acceteroneter
ICPO16	Sougata Kr. Kar, S.Pandit, Prof. S. San	ASIC for capacitive acceteroneter
KGPMEMS01	Sougata Kr. Kar Prof. S. Sen	ASIC for capacitive acceteroneter
IPC020	Pradipta Patra, Prof. Amit Patra	Quad OPAMP
IPC023	Pradipta Patra, Prof. Amit Patra	Quad Comparator

KGPSIMO	Pradipta Patra, Prof. Amit Patra	Single inductor triple output buck converter
KGPIND1	Sharmistha Dey, Sushanta Mandal, & Prof. T. K. Bhattacharyya	For measurement of inductor Characteristics
KGPOPAMP	Amal Kundu, and Prof. T. K. Bhattacharyya	Test chip for differential OPAMP
UTKARSH2	Pawan Gupta Prof. Amit Patra	Energy Based Boost Converter

## COMPUTER & INFORMATICS CENTRE

**HEAD : Professor Rajib Mall**

**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	B.Tech., M.Tech., (IIT Kharagpur), Networking
Roy, Devshri	B.Tech., M.Tech., (REC Rourkela), Artificial Intelligence, DBMS
Dutta, Bimal Kanti	M.Sc, PGDCS (Roorkee University), DBMS, Operating System, Design and Analysis of Algorithms, Computer Networks, Distributed DBMS & Graphics Programming
Das, Surid Kumar	B.Tech., M.Tech., (Rajasthan Vidyapith Deemed University), Hardware specialist, Networking
Chattopadhyay, A.	M.Sc., (Sagar University), Networking
Sudipto Das	B.Tech., M.Tech., (Rajasthan Vidyapith Deemed University), Networking

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

**Appointment :**

Partha Goswami	Senior Networking Engineer
Pramod Kumar Singh	Senior Networking Engineer
Devshri Roy	Senior System Manager
Surid Kumar Das	System Engineer – Gr. I
Alokes Chattopadhyay	System Engineer – Gr. I
Sudipto Das	System Analyst

**Promotion :**

Dilip Kumar Nanda	Chief System Manager
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**FACILITIES :**

**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. 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.

## Network Facility

IIT Kharagpur is one of the largest gigabit network in the world with gigabit backbone. Institute network is built with modern, sophisticated, state of the art fiber optic cable & network switches. The Computer and Informatics center of the institute acts 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.

## 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.

## Computational Facility

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. CIC has two PC Laboratories which have a capacity of around 110 seats each and another smaller laboratory with a capacity of around 25 seats. Each of these laboratories has all the modern facilities required to conduct laboratory classes. The Centre also has a highly sophisticated Terminal Server Room which can support about 80 terminals and are served by High End Servers. The Centers Work Station Laboratory is also available for research scholars of the Institute.

## THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	Devshri Roy	Automatic Annotation of Learning Materials for e-Learning
2.	Pramod Kumar Singh	Enhancing Solution Quality of Multiobjective Combinatorial Optimization with Hybridization of Evolutionary Algorithms

## BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	Prof. Rajeev Kumar, P K Singh	Pareto Evolutionary Algorithm Hybridized with Local Search for Biobjective TSP. In Crina Grosan, Ajith Abraham, and Hisao Ishibuchi (Eds.), <i>Hybrid Evolutionary Algorithms</i> , Studies in Computational Intelligence (SCI) series, Chapter 6	Springer	2007



## CENTRAL RESEARCH FACILITY

**CHAIRMAN : Professor Indranil Manna**

### **FACULTY ASSOCIATED**

Prof. Indranil Manna	Chairman, IIT-OPTEL Fibre Optics R&D Centre
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	In-Charge, FACS
Prof. I. Manna	In-Charge, FESEM
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, 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	
Prof. B. K. Dhindaw	In-Charge, Optical Microscopy
Prof. P. K. Datta	In-Charge, Optical Fibre
Prof. A. K. Ghosh	In-Charge, PCR
Prof. I. Manna	In-Charge, PLD
Prof. M. Chakraborty	In-Charge, SEM
Prof. C. Jacob	In-Charge, SPM
Prof. S. Das	In-Charge, TEM
Prof. K. Das	In-Charge, DSC, DTA/TGA DLS-SLS
Prof. I. Manna	In-Charge, XRD

### **Senior Scientific Officer :**

Datta, Amal Kumar	Ph.D. (IIT Kharagpur), Experimental & theoretical condensed matter Physics
Maiti, Rabindranath	M.Sc., Ph.D. (IIT Kanpur), Inorganic Chemistry, Scanning Electron Microscopy and Metal Matrix Composites.

## RESEARCH AND DEVELOPMENT

### Brief descriptions of on-going activities :

#### **DNA sequencer : Real time Polymeric Cyclic Reaction (PCR) analyzer, 2-dimensional gel electrophoresis :**

Sequencing DNA samples provided by different investigators in automated DNA sequencer.  
Analyzing gene expression in different tissue samples by Real Time PCR machine.  
Analyzing and separating protein samples provided by different investigators by 2D-gel electrophoresis system.

#### **FE-SEM Lab :**

A ZEISS SUPRA 35VP field emission gun assisted scanning electron microscope (FE SEM) with Oxford EDS Microanalysis and EBSD set up including a digital camera has recently been procured through a DST-NSTI grant. This unit is able to offer nanometric resolution and high magnification view of inorganic materials with chemical composition and micro-texture analysis. Major studies undertaken to date include Si-Ge nano-dots, Ag nanoparticle based SERS, Amorphous Al-alloy with nano-intermetallic phases, EBSD analysis of dual phase and IF steel, C-nanotube, etc.

#### **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 :**

Investigation on Electrical-, Magneto-transport (spin-polarized tunneling), Magnetism in nanocrystalline highly spin polarized Colossal Magnetoresistive (LCMO/LSMO) manganites (8-20 nm) for high density storage and MR read/write head applications.

Investigation on nanocrystalline and epitaxial thin film Dilute magnetic Semiconducting Spintronic materials (ZnO:Fe/Co/Mn/Ni) for Spin electronic (Magneto electronic) device applications.

Investigation on Giant Magneto-impedance behaviour in nanocrystalline Soft Ferromagnetic (~8 nm) metallic glasses for GMI magnetic filed sensor applications.

Investigation on Extra-ordinary Hall effect (EHE) in highly textured Ni nanoparticles embedded in epitaxial TiN matrix grown on Si substrate and Strained epitaxial 1000 Å LCMO/STO CMR thin films, Ferromagnetic-ferroelectric multiferroic materials for sensors and device applications.

#### **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 composites, Biomaterials, Nanostructured materials, steel, intermetallics, Rubber and polymer based composites, Ceramic materials, Electronic Materials, etc.

#### **MALDI-ToF :**

MALDI analysis of samples obtained from different laboratories (internal and external).

MALDI-spectral database preparations for Rhizobium

Proteomics analysis of arsenic toxicity.

**OES Lab :**

Regular chemical analysis of metallic samples.

**Optical Fiber Lab :**

We tried to run the optical tower. But it failed due to the problem in transformer. Optical lathe is not working.

**Optical Microscopy Lab :**

On going activities are related to the measurement of micro hardness on different phases in various materials like alloys treated under different conditions including weldment's and also on ceramics and polymers.

The image analysis system has been used by various researchers through out the Institute for quantitative evaluation of the phase contents in different materials.

**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 SPM laboratory provides service to a large number of departments (Metallurgical Engg., Rubber Technology, Biotechnology, Chemistry, Physics, Materials Science, Chemical Engg., Mechanical Engg., etc). A variety of samples ranging from polymers to semiconductors, including porous materials have been imaged. Information pertinent to the topography of the sample as well as images produced due to phase contrast have been provided. The primary mode of operation has been the intermittent contact mode which gives reasonably good resolution without damaging the tips too much.

**TEM and TEM Sample Preparation Lab :**

TEM constitutes arguably the most efficient and versatile tool for the characterization of different types of materials. Research workers in Metallurgy and Materials Science, Physics, Biotechnology, Geology & Geophysics, Medical Science and Technology use TEM for fine details and crystallographic features of different types of samples. The samples for TEM study are made by different instruments like Ion Miller, Jet Polisher, Cryomicrotome etc. are stationed in TEM sample preparation laboratory. These facilities are used by research workers of different Departments and Centres of the Institute as well as outside institutions and industrial organizations.

**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 Thermogravimetric 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 nano composites, 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 Panalytical X-Pert Pro PW 3040/60 high resolution X-Ray diffractometer (XRD) (two units) and the Philips PW1710 XRD have rendered extremely valuable service to the users within and outside IIT for diffraction analysis of metallic, ceramic and polymeric samples to identify the phases and their distribution, determine volume fraction of the phases, normal Bragg-Brentano powder diffraction analysis with X'Celerator, monitor phase transition and evolution, and evaluate residual stress (quantitative), texture, thin film (GIXRD) and phase transformation at high temperature.

The notable studies include determination of crystallite size of nanometric powders, composites and thin films, residual stress measurement of laser surface treated steel and titanium alloys, phase evolution of milled and sintered products.

**Thrust Areas :**

1. Nano- materials & nano-composites.
2. Proteomics, Polymer analyzer, Biophysical characterization.
3. Chemistry of Novel materials, organic and inorganic.
4. Fiber growth and characterization.
5. Fatigue and fracture of structural materials for automobile sector and power plant.
6. Micro hardness tester, image analysis set up and tensile testing for understanding the fundamentals of structure-property correlation in engineering materials.
7. Development and characterization of nano materials.
8. Microstructured and micro-chemical analysis of Nanostructured Materials.
9. Nanostructured magnetic materials (highly spin polarized), Spintronic materials for device applications (Wide band gap semiconductors), Magnetic thin films and multilayers for spin valves and spin polarized tunneling devices, Nanocrystalline Amorphous soft ferromagnetic Metallic glasses for high frequency Giant Magnetoimpedance sensors application, Multiferroics.
10. Metallurgy & Materials Engineering, Physics & Meteorology, Civil Engineering, Mechanical Engineering, etc.
11. Crystal structure analysis, grain size, residual stress and texture analysis of novel materials.
12. High temperature microstructural stability analysis by XRD.

**New Acquisitions :**

PCR Lab: Circulating cooling water bath (Julabo).  
Optical Microscopy Lab: Universal Testing Machine; Tinius Olsen. Serial No.H50KS.  
Thermal: Perkin Elmer Diamond TMA (Thermo-mechanical analyzer).  
HRTEM Lab: (i) GATAN Model 655 Dry Pumping Station as accessory for cold stage specimen holder; and (ii) Model 691 Precision Ion Mill with low energy ion guns.  
Bry-Air Dhumidifier ; Model No.FFB/300 (300CMH)  
Julabo Recirculating Cooler; Model No.F240  
Universal Testing Machine (50KN)  
Model No.655 Carbo Pumping Station  
Sputter Coater : Model No.SC 7640 i  
FEG SEM: ZEISS SUPRA 35VP - Field Emission Scanning Electron Microscope  
4-Quadrant Solid State BSE-Detector for ZEISS SUPRA 35VP  
EDX SYSTEM (MICROANALYSIS) GENESIS 2000 XMS 60 SEM FROM EDAX, USA along with OIM 2000 System with DigiView II CCD Camera for EBSD  
PLD: Pulsed Excimer Laser - Lambda Physik, Germany, Model: CompexPro 201F (700 mJ energy, 10 - 50 Hz (Variable) frequency, 248 nm (KrF) wavelength, 6-7 Watt power, 25 ns pulse width, air cooled laser system)

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

1. A National Workshop on April 23-25,  
2007  
(a) New advances in high resolution imaging by FESEM and  
(b) Theory of EBSD technique and applications  
Guest lecturer: Mr.Keith Dicks, Oxfords Instruments, UK

### **ADDITIONAL INFORMATION**

#### **Consultancy Projects :**

Consultancy work from several industries, universities and research organizations were undertaken like National Metallurgical Laboratory; Vidyasagar University; Ravenshaw Collage, Cuttack; Indian School of Mines, Dhanbad, Department of Central Mechanical Engineering Research Institute (CMERI), Durgapur, Central Institute of Plastics Engineering and Technology (CIPET), Bhubaneswar, Jadavpur Univercity, B.E.S.U, Howrah, BITS Pilani, Rajasthan, Utkal Univerisy, BITS, Mesra, Visvabharati University, Shantiniketan and Materials and Minerals Division, Regional Research Laboratory, Thiruvananthapuram.

#### **Service Rendered to Other Organizations:**

SAIL R&D, Ranchi; IACS Kolkata; VSSC Trivandrum; SN Bose Institute, Kolkata; IIT Guwahati; IIT Kanpur; BESU, Shibpur; Jadavpur University; Vidyasagar University; National Metallurgical Laboratory, Jamshedpur; Indian School of Mines, Dhanbad; Department of Central Mechanical Engineering Research Institute (CMERI), Durgapur; Central Institute of Plastics Engineering and Technology (CIPET), Bhubaneswar; BITS, Mesra and Pilani; Visvabharati University, Shantiniketan.

## CENTRAL LIBRARY

**CHAIRMAN : Professor S. S. Bandyopadhyay**

**Deputy Librarian :**

Ratnasamy, M.	MLL, PGDCA
Sutradhar, B.	Ph.D., M.Sc., MLLSc., CCA

**Assistant Librarian :**

Sharkar, Uma	MA, MLLS
Pusty, J. N.	M.Com., M.Lib.Sc.
Majumder, K.	B.Com., M.L.LSc. (Lien)
Pathak, S. K.	B.Sc., M.L.I.Sc., MA, DCA
Mohapatra, P. K.	MA, M.Lib.I.Sc.
Nandi, A.	M.Sc., M.Lib.I.Sc.

**Senior System Analyst :**

Roy, S.	M. Stat.
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The Central Library is one of the biggest Technical Libraries in Asia and its web site address is <http://www.library.iitkgp.emet.in>

### DOCUMENT COLLECTIONS

The Central Library acquired 652 general books and 1166 text books. It also added 3616 bound volumes of periodicals, 6 Theses, 8 Patents; besides reprints and annual reports of other universities. The Library subscribes 1250 journals out of which 16 journals are new addition for the subscription year 2007.

### 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 63 hours a week. On the average, the monthly circulation transactions are about 1,17,049. About 35 copies of documents were obtained through Inter-Library Loan.

### DIGITAL LIBRARY

Central Library, IIT Kharagpur has taken up a programme of extending the digital library facilities by acquiring e-resources. The following e-resources (e-books, e-journals and e-databases) have been procured for Digital library section of the Central Library.

**(a) E-book :**

- i) 10000 Springer E-books published during the year 2005, 2006 and 2007
- ii) Ebrary (30,000 e-books)
- iii) Elsevier Book Series (Chemistry)
- iv) CRC Press Hand Books

- v) Elsevier Reference Books
- vi) Thomson Reference Books

**(b) E-Journals :**

- i) Six Nature group journals have been added
- ii) Royal Society of Chemistry (RSC) Archives

**(c) E-Database (Full-text database) :**

- i) ACS Archival Access
- ii) ASTM Standards
- iii) ASTM Journal
- iv) Life Science Review Journals
- v) Communication and Mass Media
- vi) Magillion Literature Plus
- vii) Online Access of Wiley Print Subscribed Journals
- viii) Project EUCLID
- ix) RSC Archives Access
- x) Taylor & Francis
- xi) WIPS (Worldwide Intellectual property Search)

**(d) E-Database (Abstracting databases) :**

- i) CAB Abstracts (CD-ROM Version)
- ii) LISA (Library and Information Science Abstracts)
- iii) METADEX (Metal Abstracts)
- iv) SCOPUS (Abstracting, Indexing & Citation Database)

**TECHNOLOGY BOOK FAIR**

The 8th Technology Book Fair was held in the Vikramashila Complex of the Institute from February 21-24, 2007. The inaugural function took place in Gargi Auditorium on the first day of Fair at 11.00 AM. Prof. M. Chakraborty, Deputy Director, IIT Kharagpur presided over the function and Sreemati Suchitra Bhattacharya, one of the most eminent writers of contemporary Bengali literature inaugurated the Fair. Fiftytwo publishers / publishing agencies namely Elsevier, Taylor & Francis, Springer, Oxford, Cambridge University Press, etc., from various part of the country were participated the in the book fair and displayed their publications. The Fair was opened on all days from 12.00 Noon to 9.00 PM. About 30,000 current titles on Science and Technology were displayed. Books on Humanities and Social Sciences and of general interest also draw the attraction of the visitors to some stalls. About 3000 titles of latest edition to be procured by the Central Library were recommended and prioritized by the faculty members of the Institute.

**RESEARCH PROJECTS**

**Sponsored Projects :**

#	Title of the project	Sponsor(s)	Status
1.	Modernization of Library Management System using Radio-Frequency Identification (RFID) Technology	MHRD, New Delhi	Completed

**INVITED LECTURES**

- 1. S. K. Pathak A series of lectures on "Library and Information Science", Sainik School, Purulia, May 08-13, 2007

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

1. Information Management in Digital Libraries (NCIMDiL 2006) August 02-04, 2006

### **ADDITIONAL INFORMATION**

#### **Institutional Digital Repository :**

Digital Library Section of the Central Library has developed an Institutional Digital Repository (digital archiving), which was inaugurated by Prof. S.K. Dube, Director, IIT Kharagpur on August 02, 2006 during the inaugural function of NCIMDiL-2006.

#### **Cultural Program of NCIMDiL 2006 :**

- (i) An evening of drama : Gurudev Rabindranath Tagore's "Achalayatan" was staged by Chhandik, a famous drama group of West Bengal on August 02, 2006 at 6.00 PM at the Kalidas Auditorium (Viramshila Complex).
- (ii) An evening of Melody : Prof. Indrani Sen, a renowned singer of the country presented and unforgettable evening of melody to the delegates of NCIMDiL and IIT communities on August 02, 2006 at the Kalidas Auditorium ( Vikramshila Complex).

#### **Participation in Workshops :**

- (i) B. Sutradhar attended Workshop on "Networking of Libraries" on March 23, 2007 at IIT Madras
- (ii) B. Sutradhar attended Workshop and Fourth Annual Meet organized by IIT Delhi during December 19-20, 2006.



## CENTRAL WORKSHOP & INSTRUMENTS SERVICE SECTION

**Chairman : Professor P. K. Das**

**Officer :**

Patra, S.	Assistant Workshop Superintendent
Bose, J. P.	Instrumentation Engineer
Sanyal A. K.	Engineer

The Central Workshop And Instruments Service Section (CWISS), a unique service centre at IIT, Kharagpur was established in 1965 to cater to the fabrication of custom made Instruments to sustain the Post Graduated & 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.

### **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 has been installed during the current year adding 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 130 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 Step Pulley
- ix) Fabrication of Specimen hold for, XRD, X-ray, SEM
- x) Fabrication of resistively measurement set-up
- xi) Fabrication of sample holder for Spectroscopy
- xii) Fabrication of different attachment for leaser operation
- xiii) Fabrication of vacuum attachment
- xiv) Sample holder for Air lock chamber of SEM of CRF
- xv) Fabrication of high speed grinding wheel blanks
- xvi) Fabrication of Micro- channel
- xvii) Fabrication of adopters, fixtures, EDM tools.

**(b) Mechanical Instruments Section**

Various 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 & machines used in our Hospital, etc. Fabrication of sample holders of SEM & XRD, 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 oxygen & LPG for Departments, like Chemistry, Bio-technology, Chemical, Cryogenic, Mechanical, Material Science, Metallurgical Engineering, Agriculture & 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 glassware items are done as per drawing and design of the equipments. This year this Section has finished about 125 Work Orders.

**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 painting, writing of name Plates, display board & upholstery jobs as students projects.

This section also meets the major requirements of furniture of the Institute. During the year 2005-2006, this section has completed 140 Work Orders.

Details of some of the Work done during period :

i)	Faculty Table	-	08 Nos.
ii)	Office Table	-	10 Nos.
iii)	Computer Table	-	12 Nos.
iv)	Laboratory Table	-	58 Nos.
v)	Working Table	-	04 Nos.
vi)	Book Shelf	-	14 Nos.
vii)	Cabinet	-	03 Nos.
viii)	Platform	-	12 Nos.
ix)	Model for Students	-	25 Nos.
x)	Notice / Key Board	-	15 Nos.
xi)	Stool / Bench	-	18 Nos.
xii)	Box as per design / Packing	-	12 Nos.

xiii)	Scroll / Flip Board	-	08 Nos.
xiv)	Wooden Platform	-	10 Nos.
xv)	Wooden blocks	-	36 Nos.
xvi)	Name & No. Plate & Writing	-	101 Nos.
xvii)	Shoe Rack	-	20 Nos.
xviii)	Repair of old Table & Chair	-	16 Nos.
xix)	Models for Kshitij		

## ELECTRONICS SECTION

Electronic equipments and systems are an integral part of the various laboratories. This section helps in the breakdown maintenance of such equipments as and when required. It also has facilities for design, development and calibration. This section also helps students in designing and making double sided printed circuit boards using LPKF PCB Prototyping machine which uses milling process for the job. Autocad Software is used to produce the necessary files which acts as an import to the machine for producing the PCBs.

A list of some of the equipments that were repaired by this section are

i)	Electro Magnet Power Supply	-	Material Science
ii)	Rotovac Speed Control Unit	-	Chemistry
iii)	NMR Power Supply Unit	-	Chemistry
iv)	Grant-Bio-Rocker Shaker	-	Biotechnology
v)	Systronics Ph Meter	-	Biotechnology
vi)	Servo Voltage Stabilizer	-	Metallurgical & Materials Engineering, Cryogenic Engineering, Electronics & Electrical Communication Engineering
vii)	Magnetic Stirrer	-	Biotechnology, Chemical Engineering
viii)	Digital Balance	-	Ocean Engineering & Naval Architecture, Chemical Engineering
ix)	Over / Under Voltage Protector	-	Chemistry
x)	Digital Displacement Indicator	-	Civil Engineering
xi)	Regulated DC Power Supply	-	Electrical Engineering, Civil Engineering, Cryogenic Engineering, Physics & Meteorology
xii)	Oscilloscopes	-	Electrical Engineering, Physics & Meteorology, Mechanical Engineering
xiii)	Lock-in-Amplifier	-	Central Research Facility, Physics & Meteorology
xiv)	Temperature Controller	-	Chemical Engineering, Rubber Technology, Physics & Meteorology
xv)	Peristaltic Pump	-	Biotechnology
xvi)	Gel Rocker	-	Biotechnology
xvii)	Digital Nephelometer	-	Agricultural & Food Engineering
xviii)	Centrifuge	-	Agricultural & Food Engineering, Biotechnology
xix)	Magneto Velocimeter	-	Civil Engineering
xx)	Strain Indicators	-	Civil Engineering
xxi)	U.S. Therapy Machine	-	B.C.Roy Technology Hospital
xxii)	Tri Axial Shear Indicator	-	Civil Engineering
xxiii)	Wire Cut EDM Machine	-	Mechanical Engineering
xxiv)	D.C. Constant Voltage / Current Source	-	Cryogenic Engineering
xxv)	Rocker Shaker	-	Biotechnology
xxvi)	Waterbath	-	Biotechnology
xxvii)	DC Motor Controller	-	Agricultural & Food Engineering
xxviii)	Hunturlab Colorimeter	-	Post Harvest Technology
xxix)	Digital Thermometer	-	Cryogenic Engineering

xxx)	Multimeter	-	Chemistry
xxxi)	UV Lightsource	-	Materials Science
xxxii)	ALC TEL (Pump)	-	Agricultural & Food Engineering
xxxiii)	Sample Holder of DC		
xxxiv)	Conductivity Meter	-	Rubber Technology
xxxv)	Rotavac-Speed Control Unit	-	Chemistry

### **AUDIO VISUAL SECTION**

Audio Visual Section provides most modern audio visual support for conducting regular classes (approximately 120 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 T&P 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.

## CENTRE FOR EDUCATIONAL TECHNOLOGY

**CHAIRMAN : Professor T. K. Basu**

### **FACULTY**

Ray, A. K.	Professor
Bhattacharya, B.	Assistant Professor
Mohanty, Atasi	Assistant Professor
Mandal, N. R.	Professor (Joint Faculty)
Bhattacharya, J.	Professor (Joint Faculty)

The Centre for Educational Technology (CET) has been playing a pioneering role in promoting technology-enhanced learning and distance education by combining appropriate teaching-learning strategies with advanced technology tools.

### **ACADEMIC PROGRAMMES**

CET has initiated 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.

### **RESEARCH & DEVELOPMENT**

The center has produced nearly **4000 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.

### **National Programme on Technology Enhanced Learning (NPTEL) Project**

IIT Kharagpur is one of the 8 institutions involved in the MHRD funded project on “National Programme on Technology Enhanced Learning (NPTEL). The aim of the project is to improve the educational standard in all engineering institutions across the country. The project envisages design, development, delivery & evaluation of 120 web-based courses and 120 video courses in 5 Undergraduate levels of engineering disciplines over the 3 year period of 2003 – 2006. The total project cost is Rs. 3,56,3204.00.

The first phase of the project is already over – where IIT Kharagpur has produced 18 web-based and 22 video-based courses (a total of 1600hrs), in 5 areas of engineering disciplines. We have also encapsulated 40 existing video courses for inclusion into the NPTEL programme. The web-based courses are already freely available at NPTEL website at IIT Madras. A mirror site for all webcourses across all institutions have been set up at CET. The second phase of the project is due to start around January 2008 involving creation of more courses, implementation and dissemination of all courses as well as research in pedagogical issues in education.

## National Mission Challenges Project

The project conceived by the Ministry of Higher Education focuses on areas of development in the country in the realm of higher education. IIT Kharagpur has taken up the responsibility of being the “Anchor institution” for two of the demarcated areas, i.e.,

- i) **Pedagogical Research for the best way of learning for different groups**
- ii) **Multilingual Content Development**

CET IIT Kharagpur is also one of the member institutions for the group on “Standardization and Quality Assurance of E-learning Content” – which is anchored by Jadavpur University.

### Learning Resource Design & Development (LRDD) project :

- A **Virtual Classroom** technology has been developed under this project. It allows remote users to “attend” the classes fully interactively. An experiment is underway to study the effectiveness of the technology and measure various system parameters. Some of the institute courses and tutorial classes have been successfully conducted in this mode.
- The on-going **Virtual Laboratory** project is aimed at reproducing the hands-on laboratory experience of selected courses very closely, on computer screens - through advanced modelling and simulation techniques.
- **LCMS & Virtual Group Learning Tool**

A “Multi-party LAN – based video conferencing software has been developed and tested successfully by CET. This software is proposed to be used as “Collaborative Group Learning Tool” in the “Learning Management System” (LMS) currently under development at CET. Additionally, a sophisticated “Learning Content Management System” (LCMS) is also under development. When completed, this LCMS would allow “Subject Matter Experts” to upload content for web-based course material from remote locations.

## RESEARCH AND DEVELOPMENT

### New Acquisitions :

A state-of-the-art video systems laboratory has been set up with purchase of audio / video equipment worth Rs. 50.00 lakhs.

## ON-GOING RESEARCH PROJECTS

### Consultancy Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	National Programme on Technology Enhanced Learning (NPTEL) – 1	MHRD, New Delhi	342.00 Lakhs
2.	Pedagogical Research for the best way of learning for different groups	MHRD, New Delhi	2,100.00 Lakhs
3.	Multilingual Content Development	MHRD, New Delhi	2,000.00 Lakhs
4.	Standardization and Quality Assurance of E-learning Content	MHRD, New Delhi	500.00 Lakhs

**LECTURE BY VISITING EXPERT**

1. Prof. K. Srivathsan  
Director  
IIT, Trivandrum  
Use of Technology in Education
2. Prof. M. Radhakrihna  
Emeritus Professor  
IIT Allahabad  
Use of Technology in Education

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

1. Two "Awareness workshops" on "Use of Technology in Education" were held

## CONTINUING EDUCATION CENTRE

**DEAN : Professor Bani Chatterjee**

**Officer :**

Pal, Jadav Kr. Assistant Registrar, M.Sc. (Electronics), E-commerce (WIPO)

### FACILITIES

#### (a) Equipment

- 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
- ix) Norton Antivirus 5.0 for Windows 95/98/NT, Norton System Works 2000 for Windows 95 / 98
- x) ALGOR FEM package for stress fluid flow and electrostatic field analysis

### PARTICULARS OF M.TECH AND PH.D SCHOLARS JOINED / COMPLETED

1.	No. of Teachers completed Ph.D degree	22
2.	No. of Teachers completed M.Tech programme	18
3.	No. of Teachers joined Ph.D programme	18
4.	No. of Teachers taking advance admission to Ph.D programme	20
5.	No. of Teachers joined M.Tech. programme	14

### CD CELL ACTIVITIES

1.	Manuscripts for text books completed	2
2.	No. of CAI package completed	0
3.	No. of Text books approved	2
4.	No. of CAI packages approved	1



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

#	Title	Duration
1.	Reliability Leadership	July 03-04, 2006
2.	Accelerated Testing & Data Analysis	July 06-08, 2006
3.	Inter Personal Effectiveness (Level II)	July 10-14, 2006
4.	Research Methodology for Rural Social Science	July 17-23, 2006
5.	Aacademic Programme on Aircraft Engineering, Avionics & Manufacturing Technology for HAL Design Trainees	July 19-30, 2006
6.	Mine Management	July 25-28, 2006
7.	Vermi Composting Management	July 27-29, 2006
8.	MMTP - 2006	July 30 – August 20, 2006
9.	National Conference on Information Management in Digital Librariies (IMDL)	August 02-04, 2006
10.	Testing Evaluation & Quality in Rubber Technology	August 07-11, 2006
11.	Plasticulture for Commercial Horticulture	August 16-17, 2006
12.	Micro Irrigation for Horticultural Crops	August 22-23, 2006
13.	Stock Trading Nuts & Bolts	September 03, 2006
14.	Emerging Trends in Polymer Science & Technology	September 08-09, 2006
15.	Geoinformatics	September 11-22, 2006
16.	Workkshop on Resin Transfer Moulding Technology	September 14-16, 2006
17.	Empowering Tribal Youths Through Capacity Building For Apiary (STUP)	September 18-22, 2006
18.	Bioinformatics in Genomics and Proteonics	September 22-23, 2006
19.	Communication & Soft Skills Development	September 25-29, 2006
20.	Advanced Structural Analysis	October 09-13, 2006
21.	Precision farming in Horticulture	October 12-13, 2006
22.	Mines Safety & Legislation	October 23-27, 2006
23.	Vacuum Technology & Process Applications	November 01-11, 2006
24.	Stock Trading : Nuts & Bolts	November 04-05, 2006
25.	Reliability Centered Maintenance	November 09-11, 2006
26.	Soft Computing Tools in Civil Engineering	November 13-19, 2006
27.	Terrorism : Contemporary Challenges and Philosophy for facing them	November 16, 2006
28.	Remote Sensing & GIS	November 19 – December 04, 2006
29.	International Conference on Solidification Science & Processing Emerging Trends	November 20-23, 2006
30.	Orientation Course for DVC Engineers on Control & Instrumentation	November 20-24, 2006

31.	Advance Technologies for Water and Wastewater treatment	November 20-25, 2006
32.	Strategies for Effective Management	November 22-26, 2006
33.	Golden Jubilee Closing Ceremony	December 02-03, 2006
34.	Cold Storage of Potato (STUP)	December 05-08, 2006
35.	Design of Powered Supports for Longwall Faces	December 10-19, 2006
36.	Six Sigma Fundamentals And Applications	December 11-15, 2006
37.	XVII DAE BRNS High Energy Physics Symposium	December 11-15, 2006
38.	Decision Making Tools in Engineering	December 11-24, 2006
39.	Cryogenic Air Separation For Bhilai Steel Plant	December 12-20, 2006
40.	Indian Conference On Medical Informatics and Tele-Medicine (ICMIT-2006)	December 18-20, 2006
41.	German Language (A Crash Course)	December 18, 2006 – January 07, 2007
42.	VLSI Signal Processing	December 23-29, 2006
43.	Livelihood Generation in the Rural Sector through Transfer of Appropriate Technologies	December 23-29, 2006
44.	MEMS And Micro/Nano Systems Technology for Bio-in Plants and Bio-applications	December 28-30, 2006
45.	Certificate in Network Management	December 28, 2006 – January 12, 2007
46.	Operation & Maintenance of Rural Tools, Equipments and Power Machineries used in Agriculture, Industry & Services	January 02 – March 30, 2007
47.	Academic Program on Aircraft Engineering, Avionics & Manufacturing Technology for HAL Design Trainees	January 02 – April 30, 2007
48.	International Conference on Operations Research in Memory of Prof M.C.Puri	January 03-04, 2007
49.	STC on Hydroplant Operations For Hindustan Zinc Ltd.	January 04-19, 2007
50.	Inter National Workshop on Numerical Linear Algebra Applications to Signals, Systems and Control	January 09-11, 2007
51.	Recent Advances in Polymeric & Rubbery Materials	January 15-19, 2007
52.	Dechlorophyllation of Betel Leaves	January 15 – March 14, 2007
53.	Workshop on Correlated Systems and Novel Materials	January 16-18, 2007
54.	Success in Soft Skills	February 01-06, 2007
55.	Microwave Laboratory Experiments based on West Bengal Univ. of Technology Curriculum for Faculties & Laboratory Technicians	February 03-08, 2007
56.	Reliability Centered Maintenance - 2	February 07-09, 2007
57.	Current Trends in GIS Applications	February 15-17, 2007
58.	Image & Video Processing	February 19 – March 02, 2007

59.	Reliability & Safety Engg.	March 08-10, 2007
60.	Remote Sensing & GIS	March 11-24, 2007
61.	Chem Insight '07	March 16-18, 2007
62.	Congress of Metallurgical Professionals involving students, Industry and Teachers (COMPOSIT)	March 17-18, 2007
63.	Organic Farming For Sustainable Agriculture	March 17-31, 2007
64.	Decortication of Bahera	March 19 – May 18, 2007
65.	Total Quality Management in Service Organizations	March 22-26, 2007
66.	Remote Sensing & GIS	March 26 – April 07, 2007
67.	Purvodaya : Ascent of the East (National Conclave)	April 07-08, 2007
68.	Fabrication, repair & Installation of Non-Conventional Rural Energy Devices	April 10 – June 08, 2007
69.	Workshop on Filament Winding Technology	April 12-13, 2007
70.	Early Software Reliability Prediction	April 18-20, 2007
71.	Small Industries Management Programme (SIMAP)	April 23 – July 27, 2007
72.	Wireless Communications & Networks	May 14-19, 2007
73.	Computer Network Management	May 21 – June 12, 2007
74.	Dechlorophyllation of Betel Leaves	May 21 – July 20, 2007
75.	MEMS And Microsystems	May 28 – June 02, 2007
76.	Short Term Course on C++ & Java	May 28 – June 15, 2007
77.	DSP Tools & Practice	June 04-09, 2007
78.	Training Programme on Materials Management for Probationary Officers of Indian Railway Stores Services (IRSS)	June 11 – July 04, 2008
79.	Computer Network Management	June 15 – July 09, 2007
80.	Agro Service through Modern Agricultural Technologies	June 18 – August 31, 2007
81.	Embedded System & Technology	June 25-30, 2007
82.	Advanced Training in Agricultural Engineering (ATAE-07).	June 25 – July 15, 2007

## CENTRE FOR THEORETICAL STUDIES

**HEAD : Professor Damodar Acharya, Director, IIT Kharagpur**

### **FACULTY ASSOCIATED**

Pal, Sudebkumar Prasant (Convenor)	B.Tech. (Hons.), M.Tech, Ph.D. (IISc., Bangalore), Computer Science and Engineering (Computational geometry, Design and analysis of algorithms)
Banerjee, Soumitro	B.E., M.Tech., Ph.D. (IIT Delhi), Electrical (Nonlinear Dynamics, Chaos / Bifurcation Theory)
Roy, A. R.	M.Sc., Ph.D. (IIT Kharagpur), Mathematics (Relativistic Cosmology, Fuzzy Mathematics, Operations Research)
Mathur, B. K. (Head, Physics)	M.Sc., Ph.D. (Calcutta University), Physics (Superconductivity, Magnetism, Electronic States, Biophysics)
Taraphder, A.	M.Sc., Ph.D. (IISc., Bangalore), Physics (Theoretical Condensed Matter Physics)
Bharadwaj, Somnath	M.Sc., Ph.D. (IISc., Bangalore), Physics (Theoretical Astrophysics and Cosmology)
Kar, Sayan	M.Sc., Ph.D. (IIT Kanpur), Physics (Relativity and High Energy Physics)
Khastgir, Pratik S.	M.Sc., Ph.D. (IOP, Bhubaneswar), Physics (Mathematical Physics and Integral Models)
DasGupta, Anirvan	B.Tech., M.Tech., Ph.D. (Kanpur), Mechanical (Dynamics, Control and Robotics)
Chattaraj, P. K.	M.Sc., Ph.D. (IIT Bombay), Chemistry (Theoretical Chemistry, Quantum Chaos)
Bandyopadhyay, Sanjoy	M.Sc., Ph.D. (IISc., Bangalore), Chemistry (Computational Chemistry, Molecular Modelling)
Konar, Sushan	M.Sc., (IIT Kanpur) Ph. D., (IISc., Bangalore), Physics (Astrophysics, Quantum Field Theory)
Alam, S. S. (Head, Mathematics)	M.Sc., Ph.D., (IIT Kharagpur), Mathematics (Statistics, Operations Research, Computer Science)
Kumar, Somesh (Mathematics)	M.Sc., Ph.D. (IIT Kanpur), Statistical Decision Theory and Inference, Quantum Computing
Ghatak, S. K.	Ph.D. (Calcutta University), Condensed Matter Physics

### **Emeritus Scientist :**

Misra, J. C.	Ph.D., D.Sc., FNASc, FNAE, FIThP, FIMA (UK), FRSM (London), Applied Mathematics
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### **Officer :**

Halder, Ujal	Post Diploma in Computer Application, Diploma in Electrical Engineering., Computer (Administration, Web development, Assembling, Trouble shooting)
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Hemwati Nandan                      KFD, SRF, 3 years  
Samaresh Das Adhikari            ENV, JRF, 3 years

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 Kharagpur. 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 specialized 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**

- (i) To generate and nucleate theoretical research
- (ii) To organize seminars on diverse topics
- (iii) To organize Conferences/Workshops
- (iv) To provide research facilities to students/faculties from within and outside IIT Kharagpur

### **FACILITIES**

- (i) A Computer Lab with 7 Pentiums, a Sun Workstation from Sun Microsystems (Model Ultra 5) 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 :**

- 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 :**

#	Title of the project	Sponsor(s)	Duration
1.	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	CSIR, New Delhi	2006 – 2009
2.	Kinematics of flows in diverse contexts	DST, New Delhi	2006 – 2009
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 2006-2007 :**

#	Name of the Visitor	Institute / University	Associated Faculty
1.	Mr. Pinaki Pal	Lecturer, Kabi Sukanta Mahavidyalaya, University of Burdwan	Prof. K. Kumar Department of Physics & Meteorology

2.	Dr. Pradeepta Gupta Roy	Sr. Lecturer, Department of Physics, Raghunathpur College, Purulia	Prof. P. K. Raina Department of Physics & Meteorology
3.	Dr. Motahar Reza	Sr. Lecturer, National Institute of Science and Technology, Berhampur	Prof. S. Chakraborty Department of Mechanical Engineering
4.	Dr. TVS Arun Murthy	Lecturer, Department of Physics, SSGM College of Engineering, Shegaon	Prof. P. K. Chattaraj Department of Chemistry
5.	Dr. Sanjay Kumar Pandey	Reader, LBS College, Gonda	Prof. S. Bharadwaj Department of Physics & Meteorology
6.	Dr. Sudhansu S Maity	Lecturer, Department of Statistics, Visva Bharati University, Santiniketan	Prof. A. K. Nanda Department of Mathematics
7.	Dr. Hemwati Nandan	DSB Campus, KU, Nainital, Uttaranchal	Prof. P. K. Raina Department of Physics & Meteorology
8.	Mr. Daniel Hochlenert	Research Assistant, TU Darmstadt, Germany	Prof. A. Dasgupta Department of Mechanical Engineering
9.	Mr. Spelsberg-Korspeter Gottfried	Research Assistant, TU Darmstadt, Germany	Prof. A. Dasgupta Department of Mechanical Engineering
10.	Mr. Saswata Shannigrahi	Ph.D. Student, TIFR	Prof. S. P. Pal Department of Computer Science & Engineering
11.	Dr. Damian Giaouris	Lecturer, University of Newcastle upon Tyne	Prof. S. Banerjee Department of Electrical Engineering
12.	Dr. Bashar Zahawi	Lecturer, University of Newcastle upon Tyne	Prof. S. Banerjee Department of Electrical Engineering
13.	Dr. Arunava Chakraborty	Reader in Physics, University of Kalyani	Prof. A. Taraphder Department of Physics & Meteorology
14.	Mr. Debajit Chakraborty	Chemistry, Ex-iiitian	Prof. P. K. Chattaraj Department of Chemistry

#### LECTURE BY VISITING EXPERT

- |    |   |  |
|----|---|--|
| 1. | Professor T. V. Ramakrishnan, DAE Homi Bhabha Professor BHU, Varanasi | Many electrons together: strange goings-on in solids |
| 2. | Professor Naresh Dadhich<br>Director, IUCAA, Pune                     | Gravity in higher dimensions                         |

- |    |  |  |
|----|--|--|
| 3. | Kamales Kar<br>Saha Institute of Nuclear Physics, Kolkata  | Neutrinos in nuclear and particle astrophysics         |
| 4. | Professor Sir Michael V. Berry<br>H.H.Wills Physics Laboratory<br>University of Bristol, UK      | Physics of Non-Hermitian Degeneracies                  |
| 5. | Professor Sir Michael V. Berry<br>H.H.Wills Physics Laboratory<br>University of Bristol, UK      | Quantum Mechanics, Chaos and the Music of Primes       |
| 6. | Prof. B. M. Deb<br>Vikram Sarabhai Research Professor<br>(JNCASR, Bangalore)<br>SNBNCBS, Kolkata | Hydrogen molecule under intense laser fields           |
| 7. | Prof. Jayanta K. Bhattacharjee<br>Department of Theoretical Physics<br>IACS, Kolkata             | Convergent story of a divergent viscosity              |
| 8. | Prof. A. J. Leggett<br>Department of Physics<br>UIUC, USA  | Does the everyday world really obey quantum mechanics? |
| 9. | Professor T. V. Ramakrishnan<br>DAE Homi Bhabha Professor<br>Banaras Hindu University, Varanasi  | Many electrons together: strange goings-on in solids   |

#### BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	Prof. Sudebkumar P. Pal and Prof. Somesh Kumar	Quantum Information, Computation and Communication	Allied Publishers Private Ltd.	

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

- |    |  |                     |
|----|--|---------------------|
| 1. | Workshop on Correlated Systems and Novel Materials | January 16-18, 2007 |
| 2. | One day Symposium on Theoretical Chemistry         | March 29, 2007      |



## **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. This year 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

**PROFESSOR-IN-CHARGE (CONSTRUCTION) : Professor J. Barman**

**PROFESSOR-IN-CHARGE (MAINTENANCE) : Professor Arif Merchant**

### **Officers :**

Mukherjee, T. K.	Superintending Engineer
Roy Subrata	Executive Engineer
Rai, B. B.	Engineer
Murugananthan, N.	Engineer

Considering future increase in the students intake as well as increase in faculty strength, the Civil Works Unit of the Institute has taken up several new construction works as well as expansion works of existing buildings. They are in different stages of progress.

### **Works completed :**

The following constructions works have just completed :

1. 250 room capacity Rani Laxmi Bai Hall of Residence for Girls
2. Annexed building at IIT Kolkata Centre
3. Expansion of one more floor of Mother Teresa Hall of Residence.

### **On-going works :**

The following new projects are being implemented :

1. Students' Hall of Residence of 2000 capacity
2. Residential Apartments for faculty (150 Nos.)
3. Residential Accommodation for project staff (117)
4. Academic Complex Laboratories (6 Nos.)
5. Construction of Guest House
6. Construction of Rajiv Gandhi School of Intellectual Property Law (RGSOIPL).

### **Works in the pipeline :**

The following projects are being processed for implementation :

1. Expansion of Halls of Residence by one floor adding new stair block
2. Widening of existing roads in the campus
3. Construction of permanent ring road all around boundary wall
4. 300 No. faculty quarters
5. 600 capacity girls hostel and 2000 capacity boys hostel
6. A separate class room complex
7. New building for Chemistry along with Chemistry Laboratory and Rubber Technology Centre.

## INSTITUTE ELECTRICAL WORKS

**PROFESSOR-IN-CHARGE : Professor Sabyasachi SenGupta**

**Officer :**

Chakraborty, Dipak Kumar     Engineer (Electrical)

Ghosh, Sabyasachi             Engineer (Electrical)

Considering future increase in the students intake as well as increase in faculty strength, the Electrical Works Unit of the Institute has taken up several new assignments as well as expansion works of existing systems. They are in different stages of progress.

**Works completed :**

The following works have just completed :

1. Underground cabling of the distribution system in the Academic area & Non-Academic areas
2. Installation of Energy Meters in all Academic Departments / Centres
3. First phase of power connections to 150 Air Conditioners in faculty rooms
4. Electrical Installation for the newly constructed 1<sup>st</sup> floor Laboratory of High Pressure Building, Chemistry Department
5. Electrical Installation for newly constructed building, workshop and laboratory of Materials Science Centre
6. Rewiring of S.N. and I.G. Halls of Residence.

**On-going works :**

The following new assignments are being implemented :

1. Augmentation and modification of the receiving and distribution substations
2. Second phase of power connections to 150 Air Conditioners in faculty rooms
3. Electrical Installation for Rani Lakshmbai Hall of Residence
4. Electrical Renovation of Technology Guest House.

**SEMINAR / WORKSHOPS / CONFERENCES / SHORT TERM COURSES ATTENDED**

1. Sri D. K. Chakraborty, Engineer (Electrical) was deputed by the Institute to attend USAID/INDIA – Programme on “Best Practices in Loss Reduction, Distribution Reform, Upgrades and Management (DRUM)” At Power Systems Training Institute, Bangalore, NPTI, Ministry of Power, Government of India     March 2007

## **INSTITUTE WATER WORKS**

**PROFESSOR-IN-CHARGE : Professor Sudhindra N. Panda**

**Officer :**

Biswas, Shyamal Kr.                      Engineer

### **NEW ACQUISITIONS**

1.        One 15 HP submersible pump and control panel for ZH deep tubewell

### **MAJOR ACTIVITIES**

In addition to the normal maintenance jobs, the following major jobs were undertaken by Water Works during 2006-2006 (01.07.2006 – 30.06.2007) :

1.        Drilling of a new deep tubewell at Balarampur
2.        Construction of iron removal filter for Dandakaryana tubewell
3.        Replacement of flushing cistern at Campus

## KALPANA CHAWLA SPACE TECHNOLOGY CELL

**CHAIRMAN : Professor Somnath Sengupta**

### **FACULTY**

#### **Professor :**

Sengupta, Somnath	Ph.D., Image & Video Processing
Sarkar, B. K.	Ph.D., RF & Microwave Engineering
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

#### **Associate Professor :**

Sanyal, S.	Ph.D., RF & Microwave Engineering
Chakraborti, S.	Ph.D., Communication

#### **Assistant Professor :**

Saha, G.	Ph.D., Communication
Sinha, M.	Ph. D., Aerospace 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 :**

Narayanan, K. G.	Ph.D., Microwave Imaging, Avionics
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#### **Chair Professor :**

Sarkar, B. K.	Ph.D., RF & Microwave Engineering
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#### **Officer :**

Sahoo, G.	Ph.D., EMI / EMC, Microwave, Waveguide Slot Antenna and Mining Electronics
Das, S.	Ph.D., MEMS
Chakraborty, P.	Ph.D., Solid-state Science and Technology
Guchait, 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 :**

Prof. 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 17<sup>th</sup> November 2004 this Cell has been functioning under the supervision of chairman of Space Technology Cell since June 1998. The Cell is being funded by ISRO, DRDO, CMPDIL Ranchi, etc. During the period under report the following highlights of sponsored research activities in this inside KCSTC and in different of departments of IIT :

1. Dual Mode Ring Resonator Bandpass Filter with wide stopband
2. Design of Wide-band, Sharp-rejection Bandpass Filters with Parallel – coupled Lines
3. Compact Bandpass Filters with Wide Controllable Fractional Bandwidth
4. Analysis of linear tapered waveguide by two approaches
5. Compact Sharp cutoff wide stopband low-pass filter using defected ground structure and spurline
6. Size Reduction and Harmonic Suppression of Microstrip Branch – Line Coupler Using Defected Ground Structure
7. On An Algorithm for Boundary Estimation of Commonly Occuring 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
14. An Energy – Efficient Packet Filtering Architecture for Wireless Sensor Nodes
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 Supperssion 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
26. Compact Bandpass Filter for Ultra –Wide Band Communication
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
31. Designing Matched Filter for Imaging of Buried Objects, Water Layer and Voids within the Earth Surface & b amp; Underground Coal Mines using Electromagnetic Wave
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
39. Augmentation of Anti-Jam GPS system on Moving Platform using Adaptive Array Antenna: a Low Side Lobe- Constant Radiated Power Algorithm and DOA Estimation Algorithm measuring the Deviation of Look Angle
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, 19<sup>th</sup> 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 Weigth%) nanocomposite

**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

## ON-GOING RESEARCH PROJECTS

### Sponsored Projects :

#	Title of the project	Sponsor(s)	Duration
1.	Electromagnetic Modeling of High Frequency Electronic Systems to Estimate Electromagnetic Compatibility	DST, New Delhi	3 years
2.	The Feasibility Study for Missile-Borne Phased Array Radar to Detect Small RCs Targets Using Commercial of the Shelf (Cots) Components	RCI, Hyderabad	18 months
3.	Development of Specific Software Modules for Realising Monopulse Slotted Array Antenna Using Non-Standard Wave guide at Ku-Band Along Sensitivity Analysis	RCI, Hyderabad	24 months
4.	Feasibility Study for the Application of Radar Technique for Detection & Mapping of Geological Faults and Water Bodies in Underground Coal Mines	CMPDIL, Ranchi	12 months
5.	Feasibility Study of Anti-Jam GPS Receiver for GPS Guided Weapons	ARMREB, New Delhi	18 months
6.	Study of Matched Filter Design on Trans-receive Characteristics for a Monopole Antenna	ARDE, Pune	6 months

### Consultancy Projects :

#	Title of the project	Sponsor(s)	Duration
1.	Chemical and EM Testing and Interpretation of LPG Converter	Mumbai	October 21–28, 2005
2.	Preparation of Vision/theme and feasibility report	Tirupati Assets Pvt. Ltd., Kolkata	March 27, 2006 – September 26, 2006

## LECTURE BY VISITING EXPERT

1. Dr. P. S. Goel, Ministry of Earth Science      Space – The Challenging Frontier

## INVITED LECTURES BY FACULTY MEMBERS

1. Prof. Ajay Chakrabarty      “EMI /EMC & Mobile Antenna” at Nirma University
2. Prof. Ajay Chakrabarty      “EMI /EMC” at Future Institute of Technology, Sonarpur
3. Prof. Ajay Chakrabarty      “EMI/EMC” at BIT Mesra
4. Prof. Ajay Chakrabarty      “EMI/EMC” at NIT Durgapur
5. Prof. Ajay Chakrabarty      “EMI/EMC” at DIATM, Durgapur
6. Prof. Ajay Chakrabarty      “EMI/EMC” at IEEE Conference in Calcutta
7. Prof. Ajay Chakrabarty      “EMI/EMC” at Jadavpur University



8.	Prof. Ajay Chakrabarty	“EMI/EMC” at Bengal Engineering College
9.	Prof. Ajay Chakrabarty	“EMI/EMC activity, EMI/EMC, Mobile antenna” at INCEMIC
10.	Prof. Ajay Chakrabarty	“EMI/EMC” at BITS Pilani
11.	Prof. Ajay Chakrabarty	“Advanced Microwave Technology” at University Institute of Technology, Barkatullah University
12.	Prof. Ajay Chakrabarty	“EMI/EMC” at BIT Mesra, Ranchi
13.	Prof. Amit Patra	Power Management Circuits at National Semiconductor Corporation, Santa Clara, USA
14.	Prof. Amit Patra	Power Management Circuits at Intel Corporation, Portland, Oregon, USA
15.	Prof. Amit Patra	Online Testing of Digital VLSI Circuits at Intel Corporation, Portland, Oregon, USA
16.	Prof. Kanchan Chowdhury	“Oxygen Safety” at Queensland University of Technology, Brisbane, Australia

#### THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	Pramesha	Estimation of Error Induced in the Near-Field due to Measuring Probe
2.	Saswati Ghosh	Studies on Loaded and Unloaded Wire Antennas as EMI Sensors
3.	Gautam Mohanti	Genetic Algorithm for Array Antenna Design
4.	Y. K. Singh	Design, Simulation and Fabrication of Microstrip and Waveguide Filters.

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

1. “STC on Image and Video Processing” Feb 19- March 2, 2007 at ECE, IIT Kharagpur
2. “Frequency and Spectrum Management” held on 20<sup>th</sup> June to 3<sup>rd</sup> July, 2005 at KCSTC, IIT Kharagpur
3. “Electromagnetic Modeling of Composite Metallic and Dielectric Structures” held on October 17<sup>th</sup> to 21<sup>st</sup>, 2005 at KCSTC, IIT Kharagpur
4. “Electromagnetic Interference (EMI), Electromagnetic Compatibility (EMC) and Electromagnetic Pulse (EMP) held on 26<sup>th</sup> June to 7<sup>th</sup> July 2006, at KCSTC, IIT Kharagpur
5. Microwave & EMI Measurement held on July 9- July 20, 2007, at KCSTC, IIT Kharagpur
6. Coordinated a one-week Short Course on ‘Wireless Communications & Networks’ 15th May – 20th May’06, GSS School of Telecomm., IIT Kharagpur
7. Coordinated a one-week Short Course on ‘Teletraffic Engineering’ from 05th June – 10th June’06, GSS School of Telecommunications, IIT Kharagpur
8. Coordinated a one-week Short Course on ‘Wireless Networks’ from 18th May – 23rd May, 2005, GSS School of Telecommunications, IIT Kharagpur
9. Coordinated a one-week Short Course on ‘Teletraffic Engineering’ 04<sup>th</sup> July – 09<sup>th</sup> July, 2005, GSS School of Telecommunications, IIT Kharagpur

## **NATIONAL CADET CORPS (NCC)**

**OFFICER : Wg. Cdr. A. K. Bhattacharjee, Commanding Officer**

### **AIMS AND 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 2006-2007, 222 cadets of 1st year and 2nd year of engineering were trained as NCC cadets. One Service Officer, one Associated NCC Officer and 13 service personnel were involved in imparting NCC training to the IIT students.

### **LECTURE BY VISITING EXPERT**

1. Experts came from Air Force Station, Salua and 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 1<sup>st</sup> year NCC cadets at AF Station, Kalaikunda. During the camp, cadets were taken to various operational and maintenance centres of the fighter flying base. 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 coordinator also paid visit to the camp  
November 30 –  
December 09, 2006

## **NATIONAL SERVICE SCHEME**

### **STUDENTS ACTIVITIES RELATED TO NSS**

Students Volunteers of the NSS Unit of IIT, Kharagpur participated in several activities during the year 2006-2007. The activities of the Unit included Action Programmes and Awareness Generation work related to Mass Literacy, Health Care, National Integration, Promotion and Preservation of Environment, drive against Drug Addiction and Alcoholism, Empowerment of Women, Solid Waste Management, etc. The Volunteers observed the Independence Day, the International Literacy Day, the Republic Day and the Gandhi Jayanti with other various programmes including Group Discussion, Debate, Rallies, etc. befitting the occasion. The NSS Unit also organised Voluntary Blood Donation Camp at MMM hall of residence of the Institute during 2<sup>nd</sup> October, 2007 followed by Sharamdan by NSS volunteers.

The Annual Camp of the NSS Unit was held at Rural Development Centre complex, IIT Kharagpur, for 10 days (30.11.06 to 09.12.2006). For the purpose of Communal Harmony a Fund Raising Programme was also organised by the NSS Unit.

The NSS Training & Orientation Centre at IIT, Kharagpur organised 5 Orientation and 3 Refresher Courses for the NSS Programme Officers of different Universities and Colleges of Eastern and North-eastern India during 2006 – 2007. Out of the three Refreshers Courses one was organised at Synod Conference Centre, Aizawl, Mizoram. Totally 196 participants have attended in the above mentioned courses.

## **RAJBHASHA VIBHAG**

**CHAIRMAN : Professor Hare Ram Tewari**

**FACULTY :**

**Assistant Professor :**

Tyagi, C. P.

Ph.D. (BHU, Varanasi)

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, Rajbhasha Vibhag was separated from the Department of Humanities & Social Sciences. It functions now as an independent entity.

It has a well established setup with fullfledged Library of not less than 500 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". It has organised a Kavi Sammelan on Oct. 30, 2006. "Awaaz". a student magazine in Hindi, was launched on Oct. 30, 2006. A 'Hindi Saptah' was organised in the month of September 2006 in which several competitions were held for both non-Hindi speaking employees and students of the Institute. Cash prizes were given to successful participants.

## SPONSORED RESEARCH & INDUSTRIAL CONSULTANCY

DEAN : Professor P. P. Chakrabarti

Officer :

Mandal, Manoj K. B.Tech (Hons), M.Tech., MBA, Finance

With 19 departments, 13 academic centers and a large number of advanced R&D laboratories this institute continues to carry out research and development in a number of unique thrust areas.

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 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 the unique **male contraceptive, RISUG** that is undergoing third phase of trials. Interdisciplinary research is being carried out in areas of **non-invasive measurements**, advanced image processing, medical implants, **orthopaedic 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, thermal engineering, etc. A new thrust has been provided in 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.

The areas of software development, planning, management, ERP and the like 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. **ERP software** has been developed and deployed in Coal India, Neyveli Lignite Corporation and other organizations.

During the last year, the Institute received 166 research projects for a total value of 4407.16 lac and 129 consultancy projects for Rs. 1009.02 lac compared to 171 research projects for a total value of 4169.86 lac and 152 consultancy projects for Rs. 1054.19 lac in the previous year. Thus a total of

295 projects were received during the year for total value of Rs. 5416.18 lac from Government, private and international funding agencies/enterprises.

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. 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, 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, 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. The Institute is working towards development of major research and development units in energy and nanotechnology.

## SCIENCE & TECHNOLOGY ENTREPRENEURS' PARK

### Officer :

Mandal, N. R. B.Tech (Hons), Ph.D., Marine Construction & Welding Technology  
Sarkar, Prabir K. M.Com., PGD in Tea Management, Tea Production

### RESEARCH AND DEVELOPMENT

#### a) Brief Description of on-going activities

1. Miscellaneous Products
  - i) Fiber Glass Fabric filter for high temperature application
  - ii) Rubber roller for rice husking mill
  - iii) Glass works
  - iv) Fibre glass composite dish antenna for DTH application
  - v) Jatropha derived bio-diesel
  - vi) Fibre glass axle weigh pad
2. Software products
  - i) Interactive Software Integrated Learning System (ISLIS)
  - ii) Data security
  - iii) Software solutions for school e-governance
  - iv) Hospital management software
  - v) Online campus information system
  - vi) Development of ERP for a medium scale shipyard
3. Agriculture based products & activities
  - i) Organic fertilizer through vermicomposting
  - ii) Tea processing

#### b) Thrust Areas

1. Bio-diesel from Jatropha oil
2. Polyphenol extraction from green tea leaves
3. Stevioside extraction
4. Development of FRP composite highway barriers and culverts
5. Development of friction stir welding tool and procedure for aluminum alloy

### ON-GOING RESEARCH PROJECTS

#### Sponsored Projects :

#	Title of the project	Sponsor(s)	Project status
1.	Development of FRP Roadside Barriers for Indian National Highways	National Highway Authority of India	Ongoing
2.	Development of Laser Assisted Friction Stir Welding Process for C-Mn Steels	Naval Research Board	Sanction awaited
3.	Recycling of cuttings of new notes and shredded faulty notes for making composite currency packing box	Bharatiya Reserve Bank Note Mudran Ltd. Salboni	Ongoing

4.	Development of web enabled on line (remote) condition monitoring and fault identification system for HEMM in open cast projects	Coal India Ltd.	Sanction awaited
5.	Development of Ultra-High Gas Purification System to Remove Dust and Gaseous Pollutants from Coal Gasification / Pyrolysis Plant	Ministry of Coal	Sanction awaited
6.	Welding Distortion Control Project	Garden Reach Shipbuilders & Engineers Ltd.	Ongoing

### **MAJOR ACTIVITIES**

Major activities are related to business incubation and providing technology support to wide variety of entrepreneurs and organisations

### **COLLABORATIVE EFFORTS**

1. A comprehensive online test management solution for IFFCO, and e-recruitment solution for Employment News in collaboration with Monster.com
2. School Management software to Navodaya Vidyalaya Samiti in collaboration with Hunt Technologies Ltd.
3. Collaborative work with Garden Reach Shipbuilders & Engineers Ltd., Kolkata in developing a single side single pass submerged arc welding procedure for welding of DMR 249A steel plates in the thickness range of 3mm to 12mm using a reusable backing strip

### **LECTURE BY VISITING EXPERT**

1. Prof. Paul Crutzen, Nobel Prize winner in Chemistry, 1995, visited Bio-diesel pilot plant at STEP IIT Kharagpur and discussed aspects related to nitrogen activity and its effect on ozone layer

### **SEMINAR / WORKSHOPS / CONFERENCES / SYMPOSIA / SHORT TERM COURSES ORGANISED**

1. Microcontroller and FPGA-based embedded systems May 28 to June 29, 2007
2. Entrepreneur Development Programme April 14, 2007
3. Database and Web Development June 29 to July 22, 2007
4. Course on Agri-Clinics and Agri-Business December 20, 2006 to February 19, 2007
5. Organic manure through Vermicomposting
6. Course on ASP.net



## TRAINING & PLACEMENT SECTION

**PROFESSOR-IN-CHARGE : Professor Gautam Sinha**

### PLACEMENT DETAILS

The Training and Placement Section is responsible for arranging practical training for 3<sup>rd</sup> 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.

150 companies / organizations visited the campus for recruitment in 2006-2007. 18 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 as on 30.06.2007 are as follows :

<u>Course / Degree</u>	<u>No. of students interested</u>	<u>No. of students placed</u>
B.Tech. (Hons.)	324	311
B.Arch. (Hons.)	09	09
M.Sc.	128	99
Dual Degree M.Tech.	161	157
M.Tech.	383	289
MS	07	06
MCP	20	16
MBM	118	118
MMST	0	0
PGDIT	77	48
PGDTNM	10	08
Ph.D.	01	01
Total	1238	1062

### SUMMER TRAINING

Eight weeks of Summer Practical Training at the end of 3<sup>rd</sup> 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 1450 companies / organizations in India were contacted for training facilities for the last summer vacations in May-July 2007. Among these 108 in India had offered training facilities, out of which 70 organizations had extended out-of-pocket allowances (covering 355 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 J. 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/-.

135 students had taken up summer training in organizations abroad during the summer 2007. During summer 2007, a total of 490 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 2006-2007 placement saw students participating in running placement process. In fact, through this participation it was possible to run up to seven 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 S. S. Pathak**

**Officer :**

Mr. Pankaj Gupta                      B.Tech. in Computer Engineering

**NEW PLANNING**

- i) Telephone facilities will be extended to Rajiv Gandhi School of Intellectual Property Law, SMST, etc.
- ii) Telephone to every Residential Quarter is to be given.

**WORKS DONE**

- i) TTC connectivity is extended to IIT Kolkata Campus vide Phone No. 60100, 60101 & 60102
- ii) TTC Connectivity is extended to IIT Bhubaneswar center vide Phone No. 60110 and 60111
- iii) IP Trunking provided to nationally co-coordinated Project "Design of Quality of Service National Test Bed (QOSNTB)" for experimental connectivity for Interexchange connectivity through IP Network.

## **TECHNOLOGY STUDENTS' GYMKHANA**

In pursuit of excellence and giving life a meaningful direction, T. S. Gymkhana of IIT-Kharagpur works towards profound personality development of IIT students by infusing in them a spirit of constructive co-operation, 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 2006-2007 was also full of activities and achievements and proved to be matching the high standards of organizational and leadership capabilities.

### **SPORTS AND GAMES**

#### **Inter IIT Aquatic Meet 2006**

The Inter IIT Aquatic meet was held from October 2-4, 2006 at IIT Guwahati. IIT Kharagpur got 1<sup>st</sup> position in Women's and 3<sup>rd</sup> position in Men's Swimming competition.

#### **Inter IIT Sports Meet 2006**

The 42<sup>nd</sup> Inter IIT Sports meet was held at IIT Guwahati from December 13<sup>th</sup> to 20<sup>th</sup> 2006. IIT Kharagpur won Gold medals in Weight Lifting, Volleyball and Hockey. Silver medals in Football and Table Tennis and Bronze medals in Athletics, Basketball, and Badminton in Men's section. In women's section got Gold in Table Tennis and Bronze medal in Badminton. IIT Kharagpur finished 3<sup>rd</sup> position with 52 points in Men's General Championship and finished 2<sup>nd</sup> position with 22 points in Women's General Championship.

#### **Inter Hall Aquatics Meet 2006-2007**

The Inter hall Aquatics meet was held in the month of September 2006. Championship Trophy for Swimming and Water Polo went to Nehru Hall of Residence and R. K. Hall of Residence, respectively

#### **Six-a-side Hockey Tournament**

The Six-A-Side Hockey Tournament was held in the month of October 2006. Azad Hall, R. P. Hall and LLR Hall got 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> position respectively in this tournament.

#### **Annual Athletics Meet 2006-2007**

The Annual athletics meet was held from 11<sup>th</sup> to 12<sup>th</sup> November 2006. The Inter Hall Athletics Championship Trophy went to Nehru Hall of Residence. Individual Championship Trophy won by Mr. Prashant Thakur of Nehru Hall of Residence.

### **SOCIAL AND CULTURAL**

#### **Inter Hall Social and Cultural**

Over all General Championship in Social and Cultural area went to Nehru Hall of Residence.

#### **Inter Hall Illumination and Rangoli Competition**

Was held on the festive occasion of Deepawali. The results of Illumination and Rangoli competition were Illumination – 1<sup>st</sup> R. P. Hall, 2<sup>nd</sup> R. K. Hall and 3<sup>rd</sup> V. S. Hall. Rangoli – 1<sup>st</sup> V. S. Hall, 2<sup>nd</sup> SN/IG Hall and 3<sup>rd</sup> R. K. Hall.

### **Gardening Competition**

The halls were eager to show their probity in love for nature and care of beauty. B. C. Roy Hall of Residence adjudged most beautifully developed hall garden in the Institute.

### **SPRING FEST**

The big bonanza of Social and Cultural activities was organized under the Chairmanship of Prof. R. Singh between 25<sup>th</sup> January to 28<sup>th</sup> January 2007 which was the witness of organizational prowess of IIT students.

### **INTER HALL TECHNOLOGY COMPETITION**

In Inter Hall Technology competition, General championship went to Nehru Hall.

### **THE TECHNO MANAGEMENT FEST, KSHITIZ**

The Techno management festival i.e. Kshitiz was successfully organized from 1<sup>st</sup> February to 4<sup>th</sup> February 2007 which included a multitude of Technical events and managerial events. The festival witness in presence of eminent personalities of global fame like Dr. Paul Crutzen, Nobel Laureate, Prof. Kasturi Rangan, Prof. Kevin Wariwick and Wing Commander Rakesh Sharma.

### **DEVELOPMENT IN GYMKHANA**

Technology Students' Gymkhana has set up modern Gymnasium, which includes state of art equipments in the area of cardio vascular activities, strength training and free weights. Further, first time in the IIT billiards facility has been crated. Also, infrastructure is being created for Golf. New boundary wall of Swimming Pool has been constructed.

### **GYMKHANA AWARDS**

This year 15 Institute Blues and 9 Order of Merits have been awarded to the students for their outstanding achievements in Sports and Games, Social & Cultural and Technology activities.

## CENTRE FOR OCEANS, REIVERS, ATMOSPHERE AND LAND SCIENCES

**HEAD : Professor Subir Kumar Satsangi**

### **FACULTY**

#### **Assistant Professor :**

Chakraborty, Arun	Ph.D. (IIT Delhi), Atmospheric and Ocean Modeling
Dash, Mihir Kumar	Ph.D. (Gujrat 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

#### **Professor (Joint faculty) :**

Chandrasekar, A.	Ph.D. (IISc, Bangalore), Atmospheric Physics
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#### **Associate Professor (Joint faculty) :**

Sen, D. J.	Ph.D. (IIT Delhi), Water Resource Engineering
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#### **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 :**

Allan R. Robinson	Dynamics of rotating and stratified fluids, Dynamics & modeling of Ocean currents and biological dynamics in the ocean
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

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

#### **Faculty Appointment :**

Dr. A. N. V. Satyanarayana	Assistant Professor
Dr. M. Mandal	Assistant Professor
Dr. M. Dash	Assistant Professor
Dr. A. Chakraborty	Assistant Professor
Prof. P. C. Pandey	Emeritus Professor

## RESEARCH AND DEVELOPMENT

### Brief descriptions of on-going activities :

The centre is involved in frontier research in oceanographic and atmospheric observational & modeling. In oceanography, the areas of present research activities includes tsunami observations and modeling, wave modeling and ocean circulation. A Tsunami Travel Time (TTT) atlas has been prepared for a total of 250 locations from 35 countries around North Indian Ocean rim. For the first time, Artificial Neural Network has been used to compute tsunami travel time that led to significant reduction in computation time. The centre is participating 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 improvement in understanding and prediction of severe thunderstorms associated with Nor'wester (Kaal-baishaki). Two sponsored research project is in operation at the Centre under this programme. The Centre has established a 50 meter micro-meteorological tower with various atmospheric measurement sensors for special observations during occurrence of thunderstorms in the pre-monsoon months. The same is used for observations throughout the year and is considered as a national facility. Besides, the centre is also involved in mesoscale modeling of extreme weather events viz., tropical cyclone, heavy rainfall, severe thunderstorms. This also includes mesoscale data assimilation and study on micro-physical processes. At present, the centre is looking into several other research problems such as mapping of rapid coastal erosion along the shores of eastern India, new technological design and construction of coastal embankments, modeling and monitoring river flooding etc.

### Thrust Areas :

The centre is involved in the following thrust areas of research & development :

1. Ocean State Forecasting
2. Tsunami - Observations and Modeling
3. Storm Surge - Modeling and Prediction
4. River Flooding and Vulnerability Assessment
5. Modeling / prediction of Extreme Weather Events
6. Boundary Layer Studies
7. Satellite data analysis for ocean, atmosphere & land sciences
8. Assimilation of satellite data in numerical models
9. Vulnerability assessment of Extreme Events
10. Extended Range Forecasting of Monsoon

### New Acquisitions :

1. 50-meter micro-meteorological tower under the research project "Study of Boundary Layer Characteristics at Kharagpur during occurrence of severe thunderstorms" funded by DST, Govt. of India.
2. A Visualization Laboratory has been developed for the M Tech. classes

## ON-GOING RESEARCH PROJECTS

### Sponsored Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Study of Boundary Layer Characteristics at Kharagpur during occurrence of severe thunderstorms	DST, New Delhi	47.00 Lakhs

- |    |  |                |              |
|----|--|----------------|--------------|
| 2. | Monitoring thermo-dynamical structure of atmospheric boundary layer during pre-monsoon convective activity over Kharagpur    | DST, New Delhi | 157.00 Lakhs |
| 3. | Study of variability in the air-sea interaction over the tropical Indian Ocean using the observations from Megha – Tropiques | SAC (ISRO)     | 12.00 Lakhs  |

#### **VISITS ABROAD BY FACULTY MEMBER**

- |    |                            |  |
|----|----------------------------|--|
| 1. | Dr. M. Mandal              | Attended " <i>Regional Meeting on Medium Range Weather Forecasting in Southeast Asian Region</i> "; Asian Disaster Preparedness Centre (ADPC), Bangkok, Thailand (July 11-16, 2006)  |
| 2. | Dr. A. N. V. Satyanarayana | Participated in the ' <i>International Training School on Atmospheric Brown Clouds (ABC)</i> at Bangkok (December 4-8, 2006, Maldives (December 10-14, 2006)' organized by UNEP at Asian Institute of Technology, Thailand |

#### **INVITED LECTURES BY FACULTY MEMBERS**

- |    |                        |   |
|----|------------------------|---|
| 1. | Dr. M. Mandal          | Latest Trends in Numerical Weather Prediction and their use in Aviation Weather Forecasting, August 08, 2006, Indian Air-Force Base, Kalaikunda |
| 2. | Dr. A. Chakraborty     | The 2004 Indian Ocean Tsunami and Plate motions, April 17, 2007, Raja N. L. Khan Women's College, Midnapore                                     |
| 3. | Prof. A. Chandrasekhar | National Workshop on "Mesoscale Modeling of Atmospheric Processes", Andhra University, Visakhapatnam during January 2007                        |
| 4. | Prof. A. Chandrasekhar | Department of Earth Sciences, New Delhi in February 2007  |
| 5. | Prof. A. Chandrasekhar | University of Utkal, Orissa, India in March 2007  |

#### **PATENTS GRANTED**

- |    |  |   |
|----|--|---|
| 1. | Rahul Barman, B. Prasad Kumar, Prof. P. C. Pandey & Prof. S. K. Dube | A New approach to derive Ocean parameters using Neural Networks |
|----|--|---|

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

- |    |  |                   |
|----|--|-------------------|
| 1. | Workshop on " <i>STORM Pilot Phase 2006 : Data Analysis and Modeling Results</i> ", at the Park Hotel, Kolkata | March 26-27, 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
Sarang, 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), Experimental Condensed matter Physics, Cryoinstrumentation
Chowdhury, K.	B.Tech., Ph.D. (IIT Kharagpur), Cryogenic Air Separation, Refrigeration, Oxygen Safety
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), Cryobiology, Hydrogen and Carbon dioxide storage, Nonconventional Energy, Process Intensification
Nandi, T. K.	ME, Ph.D. (IIT Kharagpur), Low Temperature Refrigeration, Turbomachinery, Thermal Engineering
Ghosh, Indranil	Ph.D. (IIT Kharagpur), Cryogenic Engineering
Ghosh, Parthasarathi	Ph.D. (IIT Kharagpur), Cryogenic Engineering
Venimadhav, Adyam	Ph.D., Functional Materials, Epitaxial thin films, Magnetic Oxides

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

#### Faculty Appointment :

Dr. Parthasarathi Ghosh	Assistant Professor
Dr. Adyam Venimadhav	Assistant Professor

#### Faculty Retirement :

Prof. V. R. Kalvey	Professor
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### RESEARCH AND DEVELOPMENT

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

1. Development of materials for magnetic refrigeration
2. Magnetic sensors based on giant magneto impedance effect of nanometric lanthanum manganites.

3. Thermophysical properties of nanofluids
4. Natural Gas processing, Hydrogen energy, separation processes, Carbon dioxide capture and sequestration, FLOX for air breathing propulsion
5. Simulation of cryogenic process plants
6. Oxygen Safety with respect to electrostatic charging of particulate contamination
7. Structural, electrical & magnetic studies on Fe<sub>2</sub> VAl Heusler alloys
8. Aluminium deposition on airframe structure
9. Vacuum drying and Freeze drying studies on vegetables and herbal plants
10. Cryosurgery, Gas hydrates, Hydrogen storage, Carbon dioxide storage
11. Fabrication of perforated plate matrix heat exchangers: Compact heat exchangers comprising alternate layers of perforated copper plate and stainless steel spacers are being constructed by diffusion bonding. The diffusion bonding is done by using a vacuum hot press (5 Ton capacity) furnace available in the Centre.
12. Development of a regenerator test setup: A test setup for measurement of ineffectiveness of a given regenerator is under development. The regenerator will be tested in the temperature range of 300K in the hot end and 77K in the cold end. Ineffectiveness is to be estimated from the measurement of boil off loss of liquid nitrogen that is due to the heat load from the regenerator.
13. Computational work on heat exchanger
14. Design and fabrication of adsorption capacity measurement set up.
15. Cryogenic turboexpander
16. Simulation of Cryogenic Process plants
17. Refurbishing a DC/RF sputtering and development of ferromagnetic/semiconductor hybrid structures for spintronics

#### Thrust Areas :

1. Magnetic materials for magnetic refrigerations
2. Science and engineering of nanofluids
3. Natural gas and hydrogen energy, precombustion/reformation and postcombustion / reformation, CO<sub>2</sub> capture from natural gas and sequestration
4. Superconducting magnets for nuclear fusion application
5. Vacuum Freeze drying for food & pharmaceutical applications
6. Novel magnetic materials
7. Non conventional energy, Process intensification, Cryobiology
8. Compact heat exchanger
9. Regenerator testing
10. Heat exchanger, Sorption cooling
11. Cryogenic Process Simulation
12. Cryogenic Expander

#### New Acquisitions :

1. Electronic Balance
2. Spin Coater
3. Vacuum Freeze drier

#### ON-GOING RESEARCH PROJECTS

##### Sponsored Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Investigation on the giant magneto-impedance (GMI) of bulk and thin films of Lanthanum Manganites and development of magnetic position Sensors	CSIR	15.00 lakh

2.	Natural Gas Processing: Removal of CO <sub>2</sub> from Sour Gas Streams	MHRD	12.00 lakhs
3.	Analysis & development of conceptual design methodologies for air collection and enrichment system of air breathing propulsion	ISRO	12.00 lakh
4.	Safe design of oxygen systems	ISRO - STC	18.40 lakh
5.	Development of infrastructural facilities at Cryogenic Engg. Centre (FIST)	DST	100.00 lakhs
6.	Studies on desorption cooling from activated carbon	IIT Kharagpur	3.00 lakh
7.	Studies on gas bearing for cryogenic turboexpander	IIT Kharagpur	4.30 lakhs
8.	Development of a test rig for characterization of cryogenic regenerators	IIT Kharagpur	0.00 lakhs
9.	Refurbishing a DC/RF sputtering and development of ferromagnetic / Semiconductor hybrid structures for spintronics	IIT Kharagpur	4.60 lakh

#### Consultancy Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	R&D Study on Aluminium coating of composite Airframe of PJ-10	DRDL	3.5 Lakh

#### 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. A. Venimadhav	Visit to Pennsylvania State University towards research collaboration (2 months)

#### LECTURE BY VISITING EXPERT

1.	Dr. Biswanath Sarkar, Institute for Plasma Research, Gandhinagar	"Involvement of Cryogenics in Nuclear Fusion Technology & ITER Project"
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#### INVITED LECTURES BY FACULTY MEMBERS

1.	Prof. Tapas Kumar Dey	On the suitability of monovalent (K&Na) doped lanthanum manganite perovskites as refrigerant for near room temperature applications. TFNSC-07, National Physical Laboratory, Delhi, November 20-24, 2006
2.	Prof. Tapas Kumar Dey	Thermo-physical properties of Nanofluids – the next generation coolants. NCTP-07 (Kolam)

- |    |  |   |
|----|--|---|
| 3. | Prof. Kanchan Chowdhury &<br>Dr. Parthasarathi Ghosh | Major Issues involved in Helium and Nitrogen Cryogenics for National Fusion Technology Programme PSSI-IPR Workshop on National Fusion Programme – ITER & IPR – Gandhinagar                        |
|    | Prof. S. S. Bandyopadhyay                            | CFD Analysis of Energy and Phase Separation in a Cryogenic Vortex Tube. International Conference on High Speed Transonic Atmospheric Air and Space Transportation, - Hyderabad – 29-30 June, 2007 |
|    | Dr. A. Venimadhav                                    | Miss fit layered cobaltate oxides for high temperature thermoelectric applications at Pennsylvania State University, USA  |
|    | Dr. A. Venimadhav                                    | Design of novel multiferroics at XIV National Conference on dielectrics and ferroelectrics held at IIT Kharagpur  |

#### THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	Soma Das	Electrical transport and magnetocaloric properties in potassium doped lanthanum manganites.
2.	Yadav Ramawadh	Numerical and experimental studies for development of a cryosurgical system
3.	Raju Muddasani	Vacuum desalination for the production of potable water from seawater
4.	K Sai Sreekanth	Vacuum systems in process applications
5.	Sudipta Naskar	Hydrogen energy: Conceptual design of cryogenic adsorption storage of hydrogen for fuel cell vehicles
6.	Kripa Shankar Gupta	Development of interactive simulator for cryogenic vaporizers
7.	Manas Kumar Dutta	Cryogenic regenerators: An experimental setup for measurement of ineffectiveness and a theoretical model for performance prediction
8.	Chandra Bhal Singh	Measurement of thermo-physical properties of polymer composites by transient hot wire technique

#### BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	Prof. S. S. Bandyopadhyay, A. K. Biswas, D. Bhattacharyya, A. K. Ray	Advances in Separation Processes	Allied Publishers, New Delhi	2007

## 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. Kanchan Chowdhury Awarded the fellowship "Endeavour India Executive Award" for 4 months to do research on Oxygen Safety at Queensland University of Technology, Brisbane, Australia

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

1. "Vacuum Technology and Process Applications" (IIT Kharagpur) August 10 - 20, 2004
2. "Cryo-pumping – Theory & Practice" – for the engineers of Alstom Ltd, Kolkata (IIT Kharagpur) May 25-26, 2005
3. "Cryogenic Air Separation" (IIT Kharagpur) March 22-26, 2005
4. Cryogenic Air Separation – 2006 (IIT Kharagpur) March 21-26, 2006
5. Cryogenic Air Separation (Praxair India Pvt. Ltd., Bangalore) May 20-28, 2006
6. Cryogenic Air Separation (Bhilai Steel Plant, Bhilai) December 12-20, 2006

## 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 procession of ceramics, Nanoceramics and Nano composites, Ceramics for thermal barrier applications, Ceramics for biomedical applications, Thin film ceramics for electronics
Das, Chapal Kumar	Ph.D., Rubber and Plastics
Ram, Shanker	Ph.D., Ceramics, 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., Semiconductor Materials and Devices
Jacob, Chacko	Ph.D., Wide Bandgap Semiconductors

#### Assistant Professor :

Basu Majumder, Subhasish	Ph.D., Electro-Ceramics
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
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#### 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. SiC thin films for high temperature electronics
3. Oxide semiconductors
4. Bio-Sensors
5. LPE of semiconductors
6. Direct Fluorination of polymers
7. Scanning Probe Microscopy of Materials
8. Polymeric Nano composites
9. Nano carbon tube & Nano carbon fiber composites

### Thrust Areas :

1. Nanomaterials, Composites, nanophosphors, Spintronic materials
2. Wide Bandgap Semiconductors
3. Sensors
4. Oxide Semiconductors
5. Polymer surface modification
6. Nano composites
7. Bio-materials
8. Smart materials
9. CNT & CNF composites based on polymer

### New Acquisitions :

1. SEM
2. XRD-EDAX
3. GPC
4. High temperature GPC
5. Gas permeation apparatus

## ON-GOING RESEARCH PROJECTS

### Sponsored Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Synthesis and characterization of processable novel co(polyetherimide)s as low dielectric constant material for microelectronic packaging	IIT Kharagpur	3.00 Lakhs
2.	Preparation of novel polymeric materials for chemical sensor application: Synthesis and tailoring of properties in molecular level	DRDO, New Delhi	7.54 Lakhs
3.	Molecularly engineered novel membrane precursors and preparation of novel polymer nano-composite membranes for selective separation of gas mixture	DST, New Delhi	50.95 Lakhs
4.	Synthesis and characterization of novel light emitting poly (arylene)s and poly (arylene ether)s and derivative thereof	CSIR, New Delhi	9.06 Lakhs

5.	Equipment donation (Alexander von Humboldt Foundation, Germany)	Humboldt Foundation, Germany	9.02 Lakhs
6.	Development of nanocrystalline materials by different routes	DST, New Delhi	84.00 Lakhs
7.	Processing of high -energy-density magnetic nanoparticles & rheological ferrofluids	DRDO, New Delhi	9.90 Lakhs
8.	Development of nanocrystalline intermetallics & nanocomposites	DRDO, New Delhi	37.00 Lakhs
9.	Development of novel nanostructured magnetic, structural and optical materials and applications	DRDO, New Delhi	29.00 Lakhs
10.	Forming of layered materials by gel casting	IIT Kharagpur	20.00 Lakhs
11.	Development of Cr <sup>3+</sup> /Cr <sup>4+</sup> co-doped stabilized c-ZrO <sub>2</sub> nanoparticles as a new series of high temperature solid electrolytes and their other applications	CSIR, New Delhi	2.32 Lakhs
12.	Direct Fluorination of Plastics and Composites	DRDO, New Delhi	34.82 Lakhs
13.	Development of Silicon Carbide Thin Films for High Temperature and High Power Devices	DRDO, New Delhi	49.76 Lakhs
14.	MOCVD growth of GaAs epitaxial layers for solar cell applications	IIT Kharagpur	3.00 Lakhs
15.	MOCVD growth and characterization of InGaP/GaAs and InGaP quantum dot solar cell	DST, New Delhi	37.56 Lakhs
16.	Synthesis and characterization of novel light emitting poly(Arylene)s and poly(Arylene ether)s and derivative thereof	CSIR, New Delhi	9.00 Lakhs
17.	Development of Polymer Based Biomimetic Sensors	DST, New Delhi	9.10 Lakhs
18.	Development and Investigation on Bio-composites	DST, New Delhi	4.968 Lakhs
19.	Thin film shape memory alloys for device applications	DRDO, New Delhi	300.00 Lakhs
20.	Development of Novel Polyphosphazene based High Performance Polymeric Composites For Wide Temperature Range Application (DNP)	DRDO, New Delhi	48.08 Lakhs
21.	Self-Reinforcing Elastomers	DRDO, New Delhi	35.00 Lakhs
22.	Direct Fluorination of Polymers and Composites	DST-ILTP Indo-Russian	9.66 Lakhs
23.	Simulation in Orientation Pattern in Self-Reinforcing Elastomers and Thermoplastics-Composites Relating to Rheology and Morphology	DST-BMBF Indo-German	7.73 Lakhs
24.	Development of High Performance Advanced Polymer Blends and Alloys for Aerospace Applications	DMSRDE Kanpur	9.00 Lakhs



**Consultancy Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Development of Polymer Coated Composites	KE Technical Textiles Pvt. Ltd.	0.30 Lakhs
2.	Porosity Measurement of Polymer Samples	IACS, Kolkata	0.45 Lakhs

**VISITS ABROAD BY FACULTY MEMBER**

1.	Dr. Sushanta Banerjee	Follow-up sponsorship program from Humboldt Foundation, Visited IPF-Dresden (May-July 2007)
2.	Prof. Ajit K. Banthia	To deliver an invited talk during an international conference (December 2006)
3.	Prof. S. Ram	Academic and research, University of Ulm, Ulm, Germany
4.	Prof. Chapal K. Das	Academic & Research TU-Chemnitz, Germany Beijing, China for conference

**LECTURE BY VISITING EXPERT**

1.	Dr. Somenath Roy	Nanoscale Platform for Ultrasensitive Detection of Biomolecules
2.	Dr. Rakesh Sohal	Praeseodymium-based high-k dielectric on 3C-SiC thin films grown by CVD

**INVITED LECTURES BY FACULTY MEMBERS**

1.	Prof. B. Adhikari	Continuing Rehabilitation Education Program for Prosthetic and Orthotic Professionals on Recent trends in Orthotic Management of Spinal Deformities, during March 12-16, 2007, organized by NIOH, Bonhoogly, Kolkata
2.	Prof. Ajit K. Banthia	Polymeric Materials : Its Emerging Trends and Applications Bengal Engineering and Science University, Shibpur, Howrah
3.	Prof. Ajit K. Banthia	Dendritic Biomaterials, Department of Chemistry, Banaras Hindu University, Varanasi
4.	Prof. Ajit K. Banthia	Polymer Materials and Composites for Application in Modern Day Energy Management, Central Fuel Research Institute, Dhanbad
5.	Prof. Ajit K. Banthia	Electrical Spectroscopy Studies of Organic / Inorganic Nanocomposites, The University of Waikato, Hamillton, New Zealand
6.	Dr. Chacko Jacob	"Nanostructures in Wide Bandgap Materials", at National Workshop on Nanotechnology and Nanomaterials, Lucknow University, Lucknow (March 24-25)
7.	Prof. Chapal K. Das	ICPP Beijing, China 2007

#### THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	Kalyani Mohanta	Effect of additives and processing parameters on characteristics of highly loaded fused silica, fused silica-alumina slurries and properties of consolidated dense and porous compacts
2.	Mamata Pradhan	Processing and microstructure of Alumina foams produced by direct foaming of sucrose and soapnut based aqueous alumina slurries
3.	E. Shivakumara	In-situ binary and ternary composites based on blends of elastomers, thermoplastics and liquid crystalline polymer.
4.	Sushanta Kumar Kamilla	Studies on the behaviour of Nickel in Gallium antimonide
5.	C. S. Reddy	Novel Nanocomposites Based on Polyolefins: Effects of Surface Functionalization of Nanosilica on the Structural Mechanical, Dynamic Mechanical and Thermal Properties of Polyolefin Composites.
6.	Swatilekha Das	Pervaporation Separation of Organic Compound-water Mixtures by Polymer Membranes

#### BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	Prof. Basudam Adhikari; Alok Kumar Sen	Macromolecular Engineering 'Utilization of polymers in sensor devices' (Chapter)	Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, Germany	2007

#### LAURELS & DISTINCTIONS

1. Dr. Chacko Jacob Materials Research Society of India Medal

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

1. Indo-German Winter Academy December 9-16, 2006
2. National Symposium on Emerging Trends in Polymer Science and Technology (ETPST-2006) September 8-9, 2006

## 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

#### **Sr. Lecturer :**

Goyal, Neeraj                  Ph. D., Network Reliability, Probabilistic Risk Assessment, Software Reliability

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

#### **Faculty Appointment :**

Prof. Neeraj Goyal          Senior Lecturer

### **RESEARCH AND DEVELOPMENT**

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

1. Two ongoing Consultancy Projects on Missile Reliability Analysis, Prediction, Estimation, Demonstration and Maintenance Planning from DRDL, Hyderabad.
2. Three Projects, i.e., Reliability Prediction (DEAL, Dehradun) and Two on Probabilistic Risk Assessment (NPCIL, Mumbai), are under negotiations.
3. Organizing third INCREASE 2007, an International Conference on Reliability and Safety Engineering
4. The Centre is regularly organizing short term courses on latest topics of Reliability Engineering for officers and engineers of the Industry, Defense Organizations and R & D Establishments.

#### **Thrust Areas :**

1. Reliability Analysis and Predictions
2. Highly Accelerated Life Testing
3. Software Reliability
4. Design for Reliability
5. System Safety and Risk

#### **New Acquisitions :**

1. Environment Testing Chambers, viz., Burn-in and Thermal Shock Chambers from ESPEC, Japan under DST-FIST Program

## ON-GOING RESEARCH PROJECTS

### Sponsored Projects :

#	Title of the project	Sponsor(s)	Duration
1.	Sponsored Project for Ph. D to Pursue Research in Software Reliability	DNV, Norway	March 2005 – February 2009
2.	Software Reliability Testing and Modelling for Safety and High Risk Applications	MHRD, New Delhi	June 2005 – May 2007

### Consultancy Projects :

#	Title of the project	Sponsor(s)	Duration
1.	RAMS for Garuda Missile System	DRDL, Hyderabad	April 2007 – March 2008
2.	RAMS for ASTRA Missile System	DRDL, Hyderabad	June 2007 – May 2008
3.	Reliability Improvement of Metering Products	Secure Meters Ltd., Udaipur	1999 – Continued

## VISITS ABROAD BY FACULTY MEMBER

1. Prof. R. B. Misra Conference AIWARM 2006, in August 2006, Busan, Korea
2. Prof. S. K. Chaturvedi Conference ISSAT 2006, in August 2006, Chicago, USA

## LECTURE BY VISITING EXPERT

1. Professor A. W. Deshpande during September 22-28, 2006

## INVITED LECTURES BY FACULTY MEMBERS

1. Prof. R. B. Misra and Prof. S. K. Chaturvedi DRDL, Hyderabad, August 2007
2. Prof. R. B. Misra, Prof. V. N. A. Naikan, Prof. S. K. Chaturvedi and Prof. N. Goyal Visakhapatnam Steel Plant, March 2007
3. Prof. R. B. Mirsra PIDILITE Industries, Mumbai, March 2007
4. Prof. R. B. Mirsra NPCIL, Mumbai, January 2007
5. Prof. R. B. Mirsra DRDL, Hyderabad, September 2006
6. Prof. R. B. Mirsra Delhi University, April 2007

## THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	P. N. S. Rao	Design of Optimal Maintenance Policies Dealing with Deterioration for Production Systems

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

- |    |  |                      |
|----|--|----------------------|
| 1. | Reliability Leadership   | July 03-04, 2006     |
| 2. | Accelerated Testing & Data Analysis  | July 06-08, 2006     |
| 3. | Reliability Centered Maintenance   | November 09-11, 2006 |
| 4. | International Conference on Reliability and Safety Engineering (INCREASE) 2006 | December 19-21, 2006 |
| 5. | Second Short Term Course on Reliability Centered Maintenance                   | February 07-09, 2007 |
| 6. | Reliability & Safety Engineering   | March 08-10, 2007    |
| 7. | “Early Software Reliability Prediction”  | April 18-20, 2007    |

## RUBBER TECHNOLOGY CENTRE

**HEAD : Professor Anil Kumar Bhowmick**

### 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 nanocomposites, 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 nanocomposites, 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 applications,
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 & 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 :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	An approach for recycling of polymeric wastes	IIT Kharagpur	1.00 Lakhs
2.	Controlled Radical Polymerization using Transition Metal Catalyst	IIT Kharagpur	3.00 Lakhs
3.	Development of Castor oil based nanocomposite for Biomedical Application	CSIR, New Delhi	7.00 Lakhs
4.	Development and properties of polymer based nanocomposites	DST, New Delhi	34.00 Lakhs
5.	Development of Advanced Electromagnetic Interference Shielding Materials from Carbon Nanotube filled Polymer Composites	IIT Kharagpur	0.50 Lakhs
6.	Development of Electron Beam Irradiated Composites based on Multi-Walled Carbon Nanotubes in Polymer Matrices	DAE, Mumbai	14.60 Lakhs
7.	Development of Jute based coated Textile	AICTE, New Delhi	15.05 Lakhs

8.	Development of Modified Bituminous Binder using Waste Plastics	DST, West Bengal	4.00 Lakhs
9.	Development of novel applications using electron beam irradiation : (i) improved extrudability of raw and waste polymers, (ii) adhesion improvement	DAE, Mumbai	17.67 Lakhs
10.	Development of polymer based nanocomposites	MHRD, New Delhi	15.00 Lakhs
11.	Development of special purpose heat resistant cable insulating compounds based on polyolefins and polydimethylsiloxane rubber blends using EB	DAE, Mumbai	13.11 Lakhs
12.	Dynamically vulcanized blends (TPVs) based on polyolefin elastomer (POE) via peroxide crosslinking (BPE)	CSIR, New Delhi	9.56 Lakhs
13.	Electron beam curing of functional elastomers : A novel approach	DAE, Mumbai	14.00 Lakhs
14.	Fundamental Studies on Improvement of ageing and degradation resistance of the hydrogenated Nitrile Rubber	Lanxess, Germany	35.00 Lakhs
15.	Fundamental Studies on Structure and Properties of Nanocomposite Rubbers for Tire Applications	Goodyear Tire and Rubber Company, Akron, Ohio, USA	24.00 Lakhs
16.	Nanotechnology and radiation processing of organic-inorganic hybrid materials based on thermoplastic elastomer	DST, New Delhi	9.00 Lakhs
17.	Novel Microporous Polymeric Membranes for Medical Applications	DBT, New Delhi	14.15 Lakhs
18.	Novel rubber based nanocomposites using nanofibers and nanographites : Development, structure and properties	DRDO, New Delhi	20.80 Lakhs
19.	Novel thermoplastic elastomers based on Epoxidized Natural Rubber and PP by dynamic crosslinking	DST, New Delhi	10.32 Lakhs
20.	Novel thermoplastic elastomers based on silicone rubber by dynamic vulcanization	IIT Kharagpur	3.00 Lakhs
21.	Polyurethane Foam for Radioactive Material Transportation Packages	DAE, Mumbai	29.00 Lakhs
22.	Preparation of Equivalent standards for Rubber mix and Products	DRDL, Hyderabad	4.00 Lakhs
23.	Segmented polyurethane (SPU) based nano composites from functionalized nanoclays with special reference to fire and flammability	ISRO, Bangalore	6.00 Lakhs
24.	Study on modification and properties of thiol terminated liquid polymers by chemical reaction with nanostructured functional materials	ISRO, Thiruvanthapuram	18.00 Lakhs



25.	Tack and cured adhesion of brominated isobutylene para methyl styrene with other rubbers	Exxon Mobil, Baytown, Texas, USA	24.00 Lakhs
26.	Transition Metal Catalyzed Radical Polymerization of the Specialty Monomers	DST, New Delhi	13.00 Lakhs

**Consultancy Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Advise on development of value added natural rubber and polymer blends	Packwell, New Delhi	0.50 Lakhs
2.	Ageing, failure analysis and life estimation of rubber seals for military aircraft		9.00 Lakhs
3.	Development of Conductive Compounds	ApolloTyre	0.56 Lakhs
4.	Development of Dough Moulding Compound	NAC Group of Industries, Aurangabad	2.00 Lakhs
5.	Development of Elastomeric Bearings	HAL, Bangalore	2.25 Lakhs
6.	Development of Fire Resistant Conveyor Belt Compound as per AS-S Grade	Phoenix Yule, Kalyani	3.20 Lakhs
7.	Development of fire resistant energy optimized belt	Phoenix Yule	2.00 Lakhs
8.	Development of Flame resistant Cable compound	Servel Udyog Ltd., New Delhi	2.50 Lakhs
9.	Development of Heat and Flame resistant conveyor belts as per AS-S specifications	PYL, Kalyani, West Bengal	3.57 Lakhs
10.	Development of polymer blends, Phase-1	Sethia Finance & Trading Co., New Delhi	2.00 Lakhs
11.	Development of rubber and polymer clad rolls at cold rolling mill complex of TATA steel	TATA Steel	20.08 Lakhs
12.	Development of rubber clad rolls used in the PLTCM and the ECL sections of the cold rolling mill complex	TATA STEEL, Jamshedpur	7.30 Lakhs
13.	Development of rubber compound for sheathing of cables	Servel Udyog Pvt. Ltd., Delhi	2.50 Lakhs
14.	Development of Steel Cord Conveyor Belt Cover Compound With High Tensile Strength	Phoenix Yule Ltd., Kalyani	2.77 Lakhs
15.	Development of test procedure for specific heat for different fibres through DSC and Study of variation of specific heat with temperature	Apollo Tyre, Limda, Vadodara	0.10 Lakhs
16.	Development of test procedure for specific heat for different rubber compounds through DSC and Study of variation of specific heat with temperature	Apollo Tyre, Limda, Vadodara	0.30 Lakhs

17.	Development of value added natural rubber	Packwell, New Delhi	0.60 Lakhs
18.	Elimination of Pit Mark on Platen during Vulcanisation of FR Conveyor Belt	Phoenix Yule	2.69 Lakhs
19.	Identification of rubber as prime materials	Customs, New Delhi	0.75 Lakhs
20.	Removal of grain mark from belt surface	Phoneix Yule	1.82 Lakhs
21.	Rubber compound analysis	Fenner	0.15 Lakhs
22.	Studies of the technical requirements of elastomeric inflatable seals	IGCAR, Kalpakkam	22.00 Lakhs
23.	Studies on the technical requirements of elastomeric inflatable seals	IGCAR, Kalpakkam	18.00 Lakhs
24.	Thermoplastic Elastomer Development	GE, Bangalore	1.50 Lakhs
25.	Utilization of waste rubber	Packwell Ind., New Delhi	1.60 Lakhs

#### VISITS ABROAD BY FACULTY MEMBER

1.	Prof. Deba Kumar Tripathy	Paper presentation (China) 12days
2.	Prof. Deba Kumar Tripathy	Chief Guest, Nepal Engineering College (Nepal) 7days
3.	Prof. Golok Behari Nando	Key note speaker and Chairing a Technical Session, in PPS-2007, Asia-Australia Meeting (Sanghai, 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 Malayasia on invitation (Kluang, Malayasia) July 17-18, 2007
6.	Dr. Nikhil Kumar Singha	On a Fellowship from Royal Society, London (Department of Chemistry & Polymeric Biomaterials, University of Sheffield) May 22 – July 20, 2006 for 75 days
7.	Dr. Nikhil Kumar Singha	Invited lecture (Durham University) 22nd June
8.	Dr. Nikhil Kumar Singha	Invited seminar (Department of Biosciences, Kent University) 9th June
9.	Prof. Anil Kumar Bhowmick	To present a paper (USA) October 10-13, 2006
10.	Prof. Anil Kumar Bhowmick	To deliver an invited talk (China) May 10-13, 2007
11.	Prof. Anil Kumar Bhowmick	To deliver an invited talk (Thailand) June 24-29, 2007
12.	Prof. Anil Kumar Bhowmick	To visit Goodyear Tire (Akron, USA) October 09, 2006
13.	Prof. Anil Kumar Bhowmick	To deliver a lecture at GLS Corporation (Chicago, USA) October 13, 2006
14.	Prof. Anil Kumar Bhowmick	To visit ZWICK-ROELL (Ulm, Germany) October 16, 2006
15.	Prof. Tapan Kumar Chaki	To attend Swiss Bonding-07 during May 9-18, 2007 at Zurich, Switzerland

### LECTURE BY VISITING EXPERT

1. Dr. S. Magonov (Veeco, California, USA) Visited the centre on 14 March, 2006 and delivered a lecture on Atomic Force Microscopy
2. Dr. Arnaud Favier (Metravib, France) Visited the centre on 12 April, 2006 and delivered a lecture on Dynamic Mechanical Analysis of Rubbers

### INVITED LECTURES BY FACULTY MEMBERS

1. Prof. Dipak Khastgir Polymer in Cable Applications (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-ICCP2007)
4. Prof. Deba Kumar Tripathy Effect of Carbon black on relaxation behaviour of Chlorobutyl rubber (Indian Rubber Expo 2007)
5. Prof. Deba Kumar Tripathy Studies on the relaxation phenomenon in carbon silica dual phase filler reinforced chlorobutyl rubber (Asia Rubtech 2006)
6. Prof. Deba Kumar Tripathy Dielectric relaxation characteristics of microcellular EPDM rubber vulcanizates (International Polymer Forum, Honzhou, China)
7. Dr. Nikhil Kumar Singha Controlled Ring Opening Polymerization of a Vinyl Cyclopropane (National Chemical Laboratory, Pune)
8. Dr. Nikhil Kumar Singha Microencapsulation of a specific drug via Suspension polymerization (Department of Chemistry & Polymeric Biomaterials, University of Sheffield, UK)
9. Dr. Nikhil Kumar Singha A Thermally Amendable Polymethacrylate by Atom Transfer Radical Polymerization (ATRP) (Durham University)
10. Dr. Nikhil Kumar Singha Polymers as Drug Delivery Vehicle (Kent University in the Department of Biosciences)
11. Prof. Anil Kumar Bhowmick Rubber Nanocomposites (Qingdao, China)
12. Prof. Anil Kumar Bhowmick Rubber Nanocomposites (Bangkok, Thailand)
13. Prof. Anil Kumar Bhowmick Rubber Education and Research in the World (Cochin, India)
14. Prof. Anil Kumar Bhowmick Nanocomposites (Goodyear Tire and Rubber Company)
15. Prof. Anil Kumar Bhowmick Thermoplastic Elastomers (GLS Corporation)

## THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	V. Vijaybaskar	Electron Beam Crosslinking of Nitrile Rubber with Special Reference to Mixed Crosslinking System

## BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	Prof. Anil K. Bhowmick	Current Topics of Elastomer Research	Taylor and Francis, USA	2007

## PATENTS GRANTED

1.	Prof. G. B. Nando and T. Vikram	Novel multifunctional additive grafted Rubber and process for the preparation thereof; Indian Patent : 0262NF20041000
2.	Prof. Anil K Bhowmick; Amit Biswas; Raja Krishnamurthy, Nisha Preschilla and Samik Gupta	Thermoplastic Elastomer Composition, Method of Making and Articles Thereof; US Pat. 201393-1 (GP2-0448) (US)
3.	Prof. Anil K. Bhowmick and Debojyoti Banerjee	Improved rubber-covered conveyor belt consuming reduced energy for driving the same; Indian Patent Application (2006)
4.	Sandip Kumar Bhattacharya, Indranil Chakraborty, Prof. Anil K. Bhowmick and Biswanath Dutta	A rubber formulation for rubber covering rolls used in steel industry; Indian Patent Application (2007)
5.	Dr. N. K. Singha	A bio-degradable plastic blend from the low density polyethylene; Indian Patent : 538/KOL/2004

## LAURELS & DISTINCTIONS

1.	Dr. Nikhil Kumar Singha	Awarded a fellowship by the Royal Society, London, UK to work in the Indo-UK Science Network Program (2006)
2.	Dr. Abhijit Bandyopadhyay	Young Scientist Award 2005 (2005)
3.	Prof. Golok Behari Nando	National Executive Committee Member - Society for Polymer Science, India (2005)
4.	Prof. Golok Behari Nando	President - Society for Polymer Science, India, Kharagpur Chapter (2006)
5.	Prof. Tapan Kumar Chaki	Vice President, Indo-Swiss Bonding (2007)

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

1. A Half-day Seminar on "Safety in Laboratory" 21st April, 2006
2. International Short Term Course on "Recent Advances in Polymeric & Rubbery Materials (RAPRM)" January 15-19
3. Technology Upgradation in Rubber Technology January 9-13, 2006
4. Testing, Evaluation & Quality in Rubber Technology August 7-11, 2006

## RURAL DEVELOPMENT CENTRE

**HEAD : Professor Hare Ram Tewari**

### FACULTY

#### Associate Professor :

Lahiri, Debabrata	Ph.D., Rural Economics, Environmental Economic & Appropriate Technology
Mahaptra, S. C.	Ph.D., Agricultural Sciences, Transfer of Technology
Bhowmick, P. K.	Ph.D., Tribal Development and Human Resources Development

#### Assistant Professor :

Chakraborty, Banhi	M.R.P., Ph.D., Rural Planning and Development
Mishra, Ashok	Ph.D., Watershed – Water Resources Development and Management
Behera, Mukunda Dev	M.Phil., Ph.D., Forest and Natural Resources Management, Remote Sensing, GIS

#### Lecturer :

Das, Bela	M.Sc., Ph.D., Environmental Geography, Land use (Rural), Environmental Impact Analysis Hazard Perception
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#### Officer :

Saha, A. K.	Ph.D.
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### FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION

#### Faculty Appointment :

Dr. Ashok Mishra	Assistant Professor
Dr. Mukunda Dev Behera	Assistant Professor
Dr. Bela Das	Lecturer (Senior Scale)

#### Faculty Promotion :

Dr. B. Chakraborty	Assistant Professor
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### RESEARCH AND DEVELOPMENT

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

1. Dry land agriculture, wasteland development, alternative farming,
2. Development and transfer of appropriate technology to rural areas,
3. Barriers in biomass gasifiers,
4. Wetland management,

5. Inland fisheries management,
6. Skill development among rural youths,
7. Research on rainwater management.

**Thrust Areas :**

1. Indigenous skill development and livelihood generation.

**New Acquisitions :**

1. Forest and natural resources management for rural security.

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Improvement in Livelihood Status of Patachitrakars of Bengal: Harnessing of Natural Resources	Heron Bonsai Ltd.	2.50 Lakhs
2.	Skill Development on "Dechlorophyllation of Betel-leaves"	DST, New Delhi	4.80 Lakhs
3.	Skill Development on "Decortication of Bahera (Terminalia Belleric)	DST, New Delhi	
4.	Skill Development Training Programme for Rural Youth for Self Employment	DST, New Delhi	8.00 Lakhs

**THESES : DOCTORAL AND MS**

#	Name of Scholar	Title of Thesis
1.	Manisha Basu	Integrated Nutrient Management of Sabaigrass – Peanut Intercropping System in Lateritic Upland

**BOOK PUBLISHED**

#	Name of the Author(s)	Title	Publisher	Year
1.	Dr. Bela Das	"River Bank Erosion Hazard: Stratified Perception and its Impact on Hazard Management"	Sivnath Sastri College, Department of Geography, Calcutta	2007

## 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 Appointment :**

Dr. Sumit Kundu                          Assistant Professor

#### **Faculty Appointed as Emeritus Professor :**

Prof. Ranjan Gangopadhyay              Emeritus Professor

#### **Faculty Promotion :**

Prof. Saswat Chakrabarti                  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; Information theoretic approach for Capacity Analysis; Multi-band OFDM-based Ultra Wide Band Systems; Development of OFDM-based Acoustic Link; QoS-enabled Routing in Mobile Adhoc Networks; Wireless Sensor Networks

**Optical Networks** : PHY and MAC Layer Issues in WDM-Based Optical Access Networks including Active and Passive Architectures; Code Design for Multi-dimensional 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. 3G / 4G Wireless Communication Systems
2. Wireless Sensor Networks
3. Software Defined Radio

**New Acquisitions :**

Software : Design toolset 'System Studio Z-2006.12' from "Synopsys", India

**ON-GOING RESEARCH PROJECTS****Sponsored Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Design and Development of a Telecom Convergence Switch	Santech Communication Pvt. Ltd.	100.00 Lakhs
2.	Development of Autonomous Underwater Vehicle	DOD, New Delhi	96.00 Lakhs

**Consultancy Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Techno-economic Feasibility Study for Hindustan Cables Limited	Ministry of Heavy Industries, GOI	39.00 Lakhs
2.	Technical Study of Hindustan Cables Limited	Hindustan Cables Limited, Kolkata	6.00 Lakhs

**VISITS ABROAD BY FACULTY MEMBER**

1.	Prof. Ranjan Gangopadhyay	International Scientific advisory Committee Meeting, Scuola Superiore Sant'Anna, Pisa, Italy (June 21-22, 2007)
2.	Prof. Ranjan Gangopadhyay	Attended the 2nd Indo-Japan Second Forum Meeting and Indo-Japan Workshop on Microwaves and Photonics Technology at Kiushu University and Osaka University, Japan (June 30 – July 8, 2007)

**LECTURE BY VISITING EXPERT**

1.	Prof. H. S. Jamadagni, IIT Madras	"Hamming on Research"
2.	M. Venkata Ramana, NVIDIA, Bangalore	"Computer Architecture and Media Communication Processor"
3.	Dr. Jaiganesh Balakrishnan, Member of Technical Staff, Texas Instruments Inc., Dallas, Texas, USA	"Ultra Wideband Communication"
4.	Dr. Kaushik Chakraborty, Department of Electrical and Computer Engineering, University of California, USA	"Wireless communication theory - an overview" and "Reliable Communication over Optical Fading Channels"

5. Mr. Arunava Chaudhuri, Senior Staff Engineer, Manager, DSP Systems Group USA Introduction to Qualcomm's 802.20 Physical Layer proposal

#### **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 03, 2007)
2. Dr. Sumit Kundu "Recent Advances in Communication Technology", College of Engineering, Bhubaneswar (February 17, 2007)
3. Dr. Sumit Kundu "Soft HO in cellular CDMA", KIIT University, Bhubaneswar (February 17, 2007)

#### **THESES : DOCTORAL AND MS**

#	Name of Scholar	Title of Thesis
1.	Debasish Bera	Design and Development of Turbo Convolutional Code using Soft Output Viterbi Algorithm (SOVA) for DVB-RCS Standard
2.	Mohammad Safiullah	Design and FPGA Implementation of a Burst QPSK Modem for Satellite Application

#### **LAURELS & DISTINCTIONS**

1. Prof. Saswat Chakrabarti Design Contest Entry at the 20th International Conference on VLSI Design, Kolkata, India, January 01-04, 2007

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

- |    |                                     |                  |
|----|-------------------------------------|------------------|
| 1. | Wireless Communication and Networks | May 14-19, 2007  |
|    | DSP Tools and Practice              | June 4-9, 2007   |
|    | Embedded Systems and Technology     | June 25-30, 2007 |

## RAJIV GANDHI SCHOOL OF INTELLECTUAL PROPERTY LAW

**HEAD : Professor Subhasish Tripathy**

### FACULTY

#### Assistant Professor :

Bandhyopadhyay Tapas	M.E., Ph.D. (IIT Kharagpur), Composite Materials
Dube Dipa	LL.M (Pune), Ph.D.(Calcutta), Criminal Law
Dube Indrajit	LL.M (Pune), Ph.D.(Calcutta), Corporate Legal System
Padmavati M	M.Sc, Ph.D. (University of Hyderabad), Plant Molecular Biology

#### Adjunct Faculty :

<b>Ganguli, Prabuddha</b>	Ph.D., Chemistry
<b>Ryder, Rodney</b>	LL.B

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

#### Faculty Appointment :

Dr. Tapas Bandhyopadhyay	Assistant Professor
Dr. Dipa Dube	Assistant Professor
Dr. Indrajit Dube	Assistant Professor

### RESEARCH AND DEVELOPMENT

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

1. Setting up of Legal Aid and IP Facilitation Clinic
2. Organization of legal aid outreach programs and interactive sessions.
3. Building up links between industry and academia for qualitative IP education.

#### Thrust Areas :

1. Intellectual Property- Law and Practice
2. Technology Management and Legal System
3. Competition Law and IP issues
4. Toxicity and Environmental Laws
5. Gender Perspective of Law

### ON-GOING RESEARCH PROJECTS

#### Sponsored Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Role of phenylpropanoids and flavonoids in defense response in maize	DST	15.00 lakhs

#### **LECTURE BY VISITING EXPERT**

1. Professor Adelman Paul, George Washington University, USA Patent Laws in USA
2. Beck Joseph, Partner, Kilpatrick Stockton LLP Copyright in US Perspective
3. Professor Butler Paul, Research Professor, George Washington University, USA Criminal Law and Information Technology
4. Professor Karamanian Susan, Associate Dean, George Washington University, USA Alternation Dispute Resolution and IPR

#### **INVITED LECTURES BY FACULTY MEMBERS**

1. Dr. Indrajit Dube Mergers & Acquisitions, Hidayatullah National Law University, Raipur, October 3-7, 2006
2. Dr. M. Padmavati Technology-IP interface, Regional Seminar – Awareness Programme on Intellectual Property Rights and Patents for Capacity Building, September 15-17, 2006, IIT Guwahati

## SCHOOL OF INFORMATION TECHNOLOGY

**HEAD : Professor Indranil Sen Gupta**

### FACULTY

#### Professor :

Sen Gupta, Indranil                      Ph.D., VLSI Design and Testing, Cryptography and Network Security, Mobile Computing

#### 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), Image & Video Processing, Computer Security, Multimedia Processing

#### Assistant Professor :

Ghosh, Soumya Kanti                      Ph.D. (IIT Kharagpur), Image & Video Processing, Geo-Spatial Database, GIS, Computer & Network Security

Samanta, Debasis                      Ph.D. (IIT Kharagpur), Low Power VLSI Circuit Synthesis, Human Computer Interaction, Information System Design

Krothapalli, Sreenivasa Rao                      Ph.D. (IIT Madras), Speech Processing, Neural Networks

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

#### Faculty Appointment :

Dr. Sreenivasa Rao Krothapalli                      Assistant Professor

#### Faculty Promotion :

Dr. Sural Shamik                      Associate 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 :**

Distributed systems, eLearning and eCommerce, mobile computing, ubiquitous computing, data mining, systems security, ad hoc sensor networks, network security, human computer interaction, geographical information system, Computer vision, information and database systems, 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 incharge of the centre

**ON-GOING RESEARCH PROJECTS**

**Sponsored Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	A web-based distributed multimedia GIS for analysis and visualization of Geo-databases	IIT Kharagpur	3.00 lakhs
2.	An Integrated Framework for Testing Object-Oriented Programs	DST, New Delhi	10.00 lakhs
3.	Content-Based Information Retrieval from Multimedia Databases	IIT Kharagpur	2.88 lakhs
4.	Development of an Enterprise GIS based on open GIS standards	DST, New Delhi	40.50 lakhs
5.	DSM-Aware Synthesis of Low Power Circuits	Intel, USA	10.00 lakhs
6.	Microsoft Lab Setup	Microsoft Corporation, USA	35.00 lakhs
7.	Middleware for Building Mobile Agent Based Distributed Applications	MHRD, New Delhi	6.00 lakhs
8.	Modeling and Management of Dynamic Multimedia Objects	DST, New Delhi	18.00 lakhs
9.	Online Authentication Checking System with IRIS Biometric Scheme	IIT Kharagpur	3.00 lakhs

10.	Properties of High Dimensional Euclidean Space and their Applications in Approximate Nearest Neighbor Search on Multimedia Databases	DST, New Delhi	3.30 lakhs
11.	Survivable Information systems Architecture with Intrusion tolerance, Containment and Recovery in Distributed Environment	DIT, New Delhi	55.00 lakhs
12.	Development of Multimodal User Interface to Internet for Common People in India	DIT, New Delhi	58.00 lakhs
13.	DSM/UDSM-Aware Synthesis for Low-Power High-Performance CMOS VLSI Circuits	CSIR, New Delhi	14.00 lakhs
14.	Efficient Index-supported Multimedia Search on the Internet (Dept. of Science & Technology)	DST, New Delhi	6.38 lakhs
15.	Enhanced SANYOG : A Portable Communication Tool for the Speech and Neuro Motor Impaired People	Media Lab Asia,	71.00 lakhs
16.	Design & Development of Models & Tools for Vulnerability Assessment of Embedded Systems	Ministry of Defense, Government of India	49.20 lakhs

#### Consultancy Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Design & Implementation of UBI LAN	United Bank of India, Kolkata	7.50 lakhs
2.	Development of parameterized templates and R-extraction tools	National Semiconductor Corporation, USA	153.00 lakhs
3.	Design & Development of a Penetration Testing And Security Assessment Tool	Ministry of Defense, Govt. of India	49.00 lakhs

#### VISITS ABROAD BY FACULTY MEMBER

1.	Dr. Shamik Sural	To present a paper and chair a session at an International Conference, Vienna, Austria (5 Days)
2.	Dr. Soumya Kanti Ghosh	Presenting paper in MAP ASIA 2006 International Conference, Bangkok, Thailand (August 29 – September 01, 2006)
3.	Dr. Debasis Samanta	To attend the IWAIT 2007 Workshop, Bangkok, Thailand (January 08-10, 2007)

#### INVITED LECTURES BY FACULTY MEMBERS

1.	Dr. Soumya Kanti Ghosh	Service Oriented Architecture for Geospatial Interoperability, AAYAAM-07 Symposium (IIT Bombay, Powai, Mumbai)
2.	Dr. Soumya Kanti Ghosh	Geo-spatial Interoperability (Goa, India)

**THESES : DOCTORAL AND MS**

#	Name of Scholar	Title of Thesis
1.	Subhagata Chattopadhaya	Fuzzy Logic-based Expert Systems for Screening and Prediction of Adult Psychoses
2.	Subhasis Mandal	An Object-Oriented Framework for Analog Layout Automation
3.	Vaskar Raychaudhury	A Middleware for Building Mobile Agent-based Distributed Applications

**BOOK PUBLISHED**

#	Name of the Author(s)	Title	Publisher	Year
1.	J. Mukhopadhyay, S. Ramamoorthy and Shamik Sural	Medical Informatics and Tele-medicine: Recent Advances	McMillan	2006

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

1. Indian Conference in Medical Informatics & Telemedicine [ICMIT-2006]
2. Indian Conference on Medical Informatics and Tele-Medicine



## SCHOOL OF MEDICAL SCIENCE & TECHNOLOGY

**HEAD : Professor Ajoy Kumar Ray**

### **FACULTY**

#### **Assistant Professor :**

Chaudhury, Koel	Ph.D., Technology in Reproductive Health
Mandal, Mahitosh	Ph.D., Cancer Biology
Bhattacharya, Sangeeta D.	Ph.D., Pediatric HIV
Mitra, Analava	Ph.D., Nutraceuticals and Herbal medicine
Chatterjee, Jyotirmoy	Ph.D., Medical Imaging & Analysis, Radiation Biology, Eco-friendly medicine, Wound research
Manjunatha, M.	Ph.D., Bio-Medical Instrumentation
Das, Soumen	Ph.D., Bio-MEMS & Medical Electronics
Dhara, Santanu	Ph.D., Biomaterials

#### **Sr. Lecturer :**

Chakraborty, Chandan	Ph.D., Medical Statistics & Statistical Pattern Recognition
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#### **Visiting Faculty :**

Bhattacharya, Parthasarathi	MD DNB, DM, Pulmonary Medicine
Bhattacharya, Pinak Pani	MD, Radiodiagnosis
Mandana, K. K.	MS, Cardio Thoracic Surgery
Gupta, Nalini Jasani	Ph.D., Genetics

#### **Adjunct Faculty :**

Banerjee, Provas	MS, Ph.D., Surgery & Wound Healing
Sharma, S. K.	MD, EKO X-Ray & Imaging

#### **Emeritus Professor :**

Guha, Sujoy K.	Ph.D., M.B.B.S., Rehabilitation Engineering, Medical Instrumentation, Application of Biomedical Engineering to Reproductive Medicine, Patient Care Systems
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## **FACULTY APPOINTMENT, PROMOTION, RETIREMENT, RE-EMPLOYMENT AND RESIGNATION**

### **Faculty Appointment :**

Dr. Mahitosh Mandal	Assistant Professor
Dr. Analava Mitra	Assistant Professor
Dr. Jyotirmoy Chatterjee	Assistant Professor
Dr. M Manjunatha	Assistant Professor
Dr. Soumen Das	Assistant Professor
Dr. Santanu Dhara	Assistant Professor
Dr. Chandan Chakraborty	Senior Lecturer

### **Faculty Appointed as Emeritus Professor :**

Prof. Sujoy K Guha	Emeritus Professor
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## **RESEARCH AND DEVELOPMENT**

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

1. Development of research laboratories at new SMST complex
2. Plan of action for setting up Dr. B C Roy Multi-Speciality Research Center
3. Creation of micro/nano fabrication facility for basic and applied medical research
4. Development of micro-fluidic Biochips / Bio-MEMS for medical applications
5. Development of single molecule DNA template nano-assembly and manipulation techniques
6. Design and Development of FPGA based artificial retina like processor
7. Laser speckle imaging of blood-flow in microcirculation
8. Development of micro-CT for pre-clinical investigation
9. Dynamics of Cardio-vascular responses to space flight
10. Development of statistical analyzer & disease pattern recognizer for Oral Pre-cancer and cancer
11. Design of an intelligent diagnostic tool through the extraction of diagnostic rules for asthma
12. Integrated macro & micro-imaging on various healing & non-healing wounds including oral & breast precancer & cancer for their early characterization through image processing & analysis as well as integration with clinico-epidemiological features
13. Physico-chemical characterization of natural wound healing agents for the development of wound dressing technology
14. Development of detailed database on respiratory rhythms for identifying their temporal & spatial characteristics in health & disease
15. Identification of mammalian biomarkers under low dose radiation biology
16. Characterization of natural materials for wound healing and development of wound healing technology
17. Development of biodegradable scaffold for tissue engineering and wound research.
18. In vitro screening of anti-diabetes molecules
19. Design of a three dimensional scaffold and drug delivery system in arthritic hip joint.
20. Design, Synthesis and reactivity of beta-lactum based hybrid molecules
21. Health Food and its applications
22. Signal Transduction
23. Molecular Targeted Therapy
24. Cancer Biomarker
25. New Cancer Drug Development

**Thrust Areas :**

1. Medical Imaging & Image Processing
2. Bio-Medical Instrumentation & Bio-sensors
3. Rehabilitation Engineering
4. Cognitive & Neuro-Science
5. Bio-MEMS
6. Medical Statistics & Bioinformatics
7. Tissue Engineering
8. Bio-Materials
9. Brain Research
10. Drug Design
11. Bio Physics
12. Bio-Mechanics
13. Nuclear Medicine, Radiation Therapy
14. Health Care Management
15. Herbal medicine & Bio-Engineering
16. Cancer Bio-maker and Drug Development

**New Acquisitions :**

1.	Weighing Machine	...	Hospital Lab.
2.	10 KVA Online UPS	...	Hospital Lab.
3.	29" Color Flat TV	...	Telemedicine Lab.
4.	TMI System	...	Bioinstrumentation Lab.
5.	Scanning Probe Microscope	...	New Complex
6.	Digital Ultrasonic Diagnostic Imaging System	...	Bioinstrumentation Lab.
7.	Co2 Incubator	...	Medical Biotech Lab.
8.	Gel Doc System	...	Medical Biotech Lab.
9.	Laminar Air Flow	...	New Complex
10.	Invt. Res. Fluorescence Microscope	...	Bioinstrumentation Lab.
11.	Impax EPS (Agfa)	...	New Complex
12.	Rotary Microtome	...	Medical Biotech Lab.
13.	Spectrophotometer	...	New Complex
14.	Ultrasound Color Doppler System	...	Bioinstrumentation Lab.
15.	Digital Oscilloscope	...	Bioinstrumentation Lab.
16.	Temp. Controlled Soldering & Desoldering Station	...	Bioinstrumentation Lab.
17.	Automatic Blood Pressure & Blood Sugar Monitor	...	Bioinstrumentation Lab.
18.	Bio-rad Filter	...	New Complex

**ON-GOING RESEARCH PROJECTS****Sponsored Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Expression of collagen types during pathological manifestation of OSF – A precancerous condition	DST, Govt. of India	20.00 Lakhs
2.	Non-linear dynamics & time series analysis of respiratory rhythms	DST, Govt. of India	20.00 Lakhs
3.	Role of Disabilities and Individual Characteristics of Workers on Occupational Injuries in Mines	DST, Govt. of West Bengal	12.26 Lakhs
4.	Design, analysis and optimization of navigation grade silicon based MEMS accelerometer	ISRO-KCSTC Cell	6.00 lakhs

5.	Development of MEMS vaporising liquid microthruster for applications at ISRO” under the scheme <i>MEMS based micro-propulsion devices for microsatellite programme</i>	ISRO-KCSTC Cell	22.00 lakhs
6.	Evaluation of S100A7 (Psoriasin) as an Early Detection Bio-Marker of Squamous cell Carcinoma	IIT, Kharagpur	3.00 lakhs
7.	Impact of Follicular Fluid and IVF Media-Generated Oxidative Stress on Oocyte Maturation, Fertilization and Subsequent Embryo Development	Department of Biotechnology	9.269 lakhs
8.	Immunological abnormalities in patients with cervical cancer: analysis of peripheral blood lymphocytes	SERC Fast Track Scheme, DST, Govt. of India	6.72 lakhs
9.	Assessment of membrane characteristics and oxidative stress-induced DNA damage in human sperm for Intra Cytoplasmic Sperm Injection	Department of Biotechnology	15.38 lakhs
10.	National Centre for the Technological Evaluation of IUD and Tubal Rings	Ministry of Health & Family Welfare	150.00 Lakhs
11.	Artificial Heart Development Programme	DST, Govt. of India	8.16 Lakhs
12.	Development of “Palposcope” for Medical Diagnostic Kit and Telemedicine	DST, Govt. of India	11.37 Lakhs
13.	Surgical Injection Device with Imaging and Force Feedback Active Guidance	DST, Govt. of India	8.00 Lakhs

#### Consultancy Projects :

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Assistance for RISUG Making		11.3268 Lakhs

#### LECTURE BY VISITING EXPERT

1.	Prof. Anil K Bera, UIUC, USA	Spatial Analysis for Medical Research
2.	Prof. R R Paul, Kolkata	Oral pre-cancer and cancer
3.	Dr. B N Chakravarthy, IRM, Kolkata	Embryonic stem cell research in India
4.	Dr. S. Mukhopadhyay, CMC Kolkata	Diagnosis of cardiac diseases and technological issue in cardio-thoracic surgery
5.	Prof. P C Purokayastha, IISWBM	Hospital finance health insurance
6.	Prof. S.P. Mukhopadhyay	Concept issues and economics of health care management
7.	Prof. Sandip Ghosh	Strategic management of health care services
8.	Dr. Mandana, AMRI, Salt Lake City	Technology in Medicine
9.	Dr. Goutam Chatterjee, MCH-Kolkata	Endoscopic imaging & optical biopsy
10.	Dr. Arun Vinaykia-USA	Tele-Radiology

#### INVITED LECTURES BY FACULTY MEMBERS

1. Dr. Soumen Das QIP workshop on "MEMS and Microsystems" held at IIT Kharagpur during May 28 to June 2, 2007.
2. Dr. Mahitosh Mandal S100A7 (Psoriasin) Mediates Anoikis Resistance and Tumor in Squamous Cell Carcinoma of the Oral Cavity, Indian Association for Cancer Research, Bhubneshwar, India, 2006
3. Dr. Analava Mitra "Practical Demonstration of human safety" Workshop on Mine Safety and Legislation-SEPT-2007, IIT, Kharagpur
4. Dr. Chandan Chakraborty "Statistics for Bioinformatics"-Workshop on Bioinformatics in Genomics and proteomics SEPT-2007, IIT, Kharagpur

#### THESES : DOCTORAL AND MS

#	Name of Scholar	Title of Thesis
1.	Sunil Kumar Jaglan	Micro-structural and biochemical changes in human spermatozoa associated with RISUG®
2.	Gautam Kumar Mahanti	Linear array antenna synthesis using genetic algorithms
3.	Shahnawaz Karim	Reactive oxygen species levels in different types of semen samples: impact of time and incubating media on tyrosine phosphorylation

#### LAURELS & DISTINCTIONS

1. Dr. Chandan Chakraborty ISCA Young Scientist Award from President of India (2006-07) in Math. Sc. (including Statistics)
2. Dr. Koel Chaudhury Reviewer for the journal of the American Society of Reproductive Medicine, *Fertility & Sterility*
3. Dr. Koel Chaudhury Reviewer for a UK journal *Expert Review of Obstetrics and Gynecology*.
4. Koel Chaudhury Reviewer for a UK journal *Women's Health*

## 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	B.Tech. (BIT, Sindri), M.Tech. (ISM, Dhanbad), 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.	B.E. (Madras), M. Tech., Ph.D. (IIT Kharagpur), Finance and Production Management

#### **Associate Professor :**

De, Sadhan K.	B.Sc.(Hons.) (Calcutta), M.Tech. (Calcutta), M.Sc.(Tech) (Loughborough), Ph.D. (Manchester), Information Systems, ERP, Business Intelligence, Technology Management Strategic Management
Rajib, Prabina	BA (Hons) (Utkal), MA (Utkal), MBM, Ph.D. (IIT Kharagpur), Finance, Risk Management
Roy, Santanu	M.S. (Physics) (IIT Delhi), Ph.D. (IIT Kharagpur), Technology and Innovation Management, Quantitative Methods, Organisational Behaviour

#### **Assistant Professor :**

Datta, Biplab	B.Arch. (IIT Kharagpur), MBEM (SPA, New Delhi), Ph.D. (IIT Delhi), Marketing
Mishra, Chandra Sekhar	M.Com. (Utkal University), Ph.D. (Utkal University), Finance, Accounting
Pradhan, Rudra Prakash	M.A.(Utkal University), Ph.D. (IIT Kharagpur), Economics
Sahney, Sangeeta	BA (Hons), (Calcutta University), MBA (Bundelkhand), Ph.D. (IIT Delhi), Marketing, Sales Management, Consumer Behaviour, Organisation Behaviour, Quality Management in Services
Mukhopadhyay, Susmita	M.Sc. – Applied Psychology (Calcutta University), PGDHRM (IISWBM), Ph.D. (Research Fellow ISI, awarded by Calcutta University), Organizational Behaviour, Human Resource Management, Business Ethics and Human Values,

**Adjunct Faculty :**

Chakravarti, Kalyan	B.Tech.(Hons.) (IIT Kharagpur), FIE (India), CE, PMD (Harvard Business School), Human Behaviour, Human Resource Management, Corporate Strategy & Leadership
Sadhu, Amar N.	M.A. (London), FCA (Eng & Wales), FIMC (London), MISP (London), Economics and Finance
Sarbadhikary, Sanjay K.	B.Com. (Hons), M.Com., LLB./BL (Calcutta University), Managerial Accounting
Singh, J.	BA (Calcutta University), PGDBM (XLRI), Ph.D. (Wharton), Organization Behaviour, Human Resource Management
Das, Purnendu Sekhar	MA (Eco), LLB (Ranchi), PGDBM (XLRI), Ph.D. (IIT Kharagpur), Personnel Management, Industrial Relations, Legal Aspects

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

Ms. Susmita Mukhopadhyay	Assistant Professor
Dr. Rudra Prakash Pradhan	Assistant Professor
Dr. Chandra Sekhar Mishra	Assistant Professor

**Faculty Promotion :**

Dr. Prabina Rajib	Associate Professor
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**RESEARCH AND DEVELOPMENT****Brief descriptions of on-going activities :**

1. Curriculum Development for MBA Programme

**Thrust Areas :**

1. Technology Travels to Villages

**ON-GOING RESEARCH PROJECTS****Sponsored Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Implementation of a Quality Management System for all Programmes of IIT Kharagpur	IIT Kharagpur	3.00 Lakh
2.	Management of Pension Obligation of IIT Kharagpur	IIT Kharagpur	0.00 Lakhs
3.	Impact of Select Issues in Consumer Demographics and Psychographics on Online Buying Behaviour	IIT Kharagpur	3.00 Lakh

**Consultancy Projects :**

#	Title of the project	Sponsor(s)	Amount (Rs.)
1.	Corporate Governance and Corporate Social Responsibility Report – A Roadmap	Jindal Bengal Steel Ltd.	0.43 lakhs

**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 Sheikawat, 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	Indian Brand Equity
13.	Mr. Alok Mookherjea, Chairman, WBEIDCL	Leadership
14.	Prof. Pitabas Mohanty, Professor, XLRI, Jamshedpur	Financial Modelling using MS Excel

**INVITED LECTURES BY FACULTY MEMBERS**

1.	Dr. Sangeeta Sahney	Globalisation : Challenges Before Indian Marketers – Rourkela Institute of Management Studies, Rourkela
2.	Ms. Susmita Mukhopadhyay	Human Relations at Work to the Employees of Burn Standard Company Ltd. – Burn Standard Company Ltd.
3.	Ms. Susmita Mukhopadhyay	Career Planning and Psychological Satisfaction in Retired Life and Orienting Family Members for a Positive Approach – Indian oil Corporation Limited
4.	Ms. Susmita Mukhopadhyay	Goal Setting and Motivating Self-Indian Ethos – Indian Oil Corporation Limited
5.	Ms. Susmita Mukhopadhyay	Academicians Role and Responsibility in Producing Professionally groomed management graduate – Institute of Environment and Management (As Resource Person in the Seminar)



6.	Ms. Susmita Mukhopadhyay	Schedule Design for Psychological and Educational Survey Research – Psychology Research Unit, Indian Statistical Institute, Kolkata (As Resource Person for the Seminar)
7.	Ms. Susmita Mukhopadhyay	Academic Career Excellence in Management - Pailan College of Management and Technology
8.	Ms. Susmita Mukhopadhyay	Self Development – Air Force Station Salua
9.	Ms. Susmita Mukhopadhyay	Interpersonal Skills – UAL Bengal
10.	Dr. Biplab Datta	4Ps of Marketing in Small Industries Management Programme (SIMAP) – Humanities & Soc. Sciences Dept., IIT Kharagpur
11.	Dr. Sadhan K De	‘ERP and SCM’, ‘World Class Supply Chain Management’ - AICTE sponsored Faculty Development Program at MIM, Ujjain, MP
12.	Dr. Sadhan K De	‘Understanding and Managing Innovation’ – Invited talk for the senior executives of Tata Refractories Ltd., Belpahar, Orissa
13.	Dr. Sadhan K. De	Taught a course “Information Security and Risk Management” in XLRI, Jamshedpur
14.	Dr. Sadhan K. De	Taught a course on “MIS and ES” at IIM Lucknow
15.	Dr. Sadhan K. De	Taught a course on ERP at XLRI, Jamshedpur

#### BOOK PUBLISHED

#	Name of the Author(s)	Title	Publisher	Year
1.	V. Raghunathan and Dr. Prabina Rajib	Stock Exchanges, Investments & Derivatives	Tata McGraw Hill India	2007
2.	Prof. S. Srinivasan	Book Chapter as Joint Author on “Software and Other Project Management Practices in India” in Applied Project Management Handbook	McGraw Hill Limited	2007
3.	Bill Taylor, Prof. Gautam Sinha and T. Ghoshal	Research Methodology : A Guide for Researchers in Management & Social Sciences	Prentice Hall of India	2006
4.	Dr. Sadhan K. De	Book Chapter on “Competitiveness and Technology Innovation; Strategic Innovation and Customer Power” for developing Master of Technology Management Course in DSIR		

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

- |    |  |         |
|----|--|---------|
| 1. | Middle Management Training Programme for Bangladeshi Companies | 6 weeks |
| 2. | Customer Satisfaction, Communications and Outreach             | 5 days  |
| 3. | Indian Share Market  | 1 day   |
| 4. | Share Trading : Nuts & Bolts                                   | 2 days  |
| 5. | OCCASIO : VGSOM's Management Fest                              | 2 days  |
| 6. | PURVODAYA : The Ascent of East                                 | 2 days  |

## CENTRE FOR OCEANS, RIVERS, ATMOSPHERE AND LAND SCIENCES

### RESEARCH PUBLICATIONS

#### Journals :

1. M. Mandal, U.C. Mohanty and P. Sinha (2006): Impact of sea surface temperature in modulating movement and intensity of tropical cyclones, *Natural Hazards*, 41, 413-427
2. Radhika Ramachandran, U.C. Mohanty, Sujata Pattanayak, M. Mandal and S. Indira Rani (2006): Location specific forecast at Sriharikota (SHAR) during the launch of GSLV-F01, *Current Science*, 91, 3, 285-295
3. M. Azadi, U.C. Mohanty and M. Mandal (2006): A Study on kinematic trajectory calculations with different Schemes using wind field of varying temporal frequency. *Journal of Computational Methods in Sciences and Engineering (JCMSE)*, 6, 1-4, 7-17
4. M. Mandal, U.C. Mohanty and A.K. Das (2006): Impact of satellite sensed wind in mesoscale simulation of Orissa super cyclone, *Indian Journal of Marine Sciences*, 35, 2, 161-173
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## COMPUTER & INFORMATICS CENTRE

### RESEARCH PUBLICATIONS

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